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A LOCAL EXPLORATION OF EDUCATORS'  
PERCEPTIONS, COLLABORATION AND USAGE OF NATURAL SITES  
IN INTRODUCING THE OUTDOORS TO MARGINALIZED STUDENTS

by

Todd Beasley

Bachelor of Science  
University of South Carolina, 1998

Master of Earth and Environmental Resources Management  
University of South Carolina, 2008

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Submitted in Partial Fulfillment of the Requirements

For the Degree of Doctor of Education in

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Accepted by:

Rhonda Jeffries, Major Professor

David Virtue, Committee Member

Christine DiStefano Committee Member

Arlene Marturano, Committee Member

Lacy Ford, Vice Provost and Dean of Graduate Studies

## **ABSTRACT**

A recent trend in social science research has focused on factors that lead to low participation rates by racial groups, specifically the African American population, within outdoor and wilderness settings as a connection to the issue of low participation rates by these same groups in outdoor and environmental careers. Much of the research has relied upon theories that address the marginalization of the African American population in relation to the social context: marginality, subculture/ethnicity, discrimination, acculturation, and opportunity. However, an area of interest that warrants a deeper examination of potential contributing causality is the role of the educator.

The purpose of this study was to compare data from informal educators at three urban wilderness sites managed by three separate entities (South Carolina Parks & Recreation, South Carolina Forestry Commission, & National Park Service) to formal educators, at low-income and majority African American student populated schools within close proximity to the natural sites. Comparisons will examine differences in awareness and perceptions of the issue of low participation rates by diverse populations in natural settings. Through a mixed methods approach within a multi-site case study, critical race theory was used to frame this examination of whether educators are aware of the lack of participation by racial minorities within the outdoors and outdoor professions and what logistical, professional, and personal factors within the educational system are contributing to the issue despite the notion that environmental education has demonstrated academic achievement. By examining available support resources at the

natural sites, and analyzing both administered surveys and informal educator focus groups, this new data will help determine whether the underlying theories of oppression related to racial minority cultures are the main causes of low participation within the outdoors and outdoor professions including those of STEM (science, technology, engineering, math) fields or whether educators need to seriously be considered as part of the underlying issue .

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## **CHAPTER ONE**

### **INTRODUCTION**

In September, 2012, I made a personal visit to Francis Beidler Forest, near Harleyville, South Carolina. Francis Beidler, a bottomland forest managed by The National Audubon Society as a wildlife sanctuary within the Four Holes Swamp system, is known for its old growth cypress and tupelo trees that are comparable only to those in Congaree National Park. Francis Beidler offers an extensive boardwalk system with many educational opportunities and resources including informal educators and park rangers that can accommodate up to 100 students or 4 groups at a time.

During my visit, I spoke quite extensively with park staff. One of the topics of the conversation, that still resonates, is the issue of under-participation by racial minority visitors either as guests during holidays, weekends or vacation periods and as students being led by teachers. While the staff was aware of the issue, what was remarkable was that they had attempted a novel approach at increasing racial minority student visitation patterns from schools within the area that is within a very rural and impoverished portion of Dorchester County. They had received a grant for the purpose of providing the local schools the funds for transportation, entrance fees, and an educator to lead tours, programs, and activities. Still, they observed, that participation was low. However, they stated there was one science teacher (a White male) who regularly took advantage of the

opportunity; however, when he relocated, his successor did not follow the same trend. This conversation was the impetus for this study.

As an educator with experiences as both a formal and informal educator and lifelong experience and participation on a personal level within natural settings, it is hypothesized that educators play a role in contributing to the causality of under-participation by racial minorities within the outdoors.

### **Purpose of Study and Research Statement**

A contemporary direction in race, diversity, and social justice research has focused on factors that lead to low participation rates by minority groups, specifically the African American population, within outdoor and wilderness settings. For the purpose of this project, minority populations are being referred to as people of color, specifically African Americans with low socio-economic status. This trend is growing as an avenue to connect and identify resolutions to the issue of low participation rates by these same groups in outdoor and environmental careers, including those within the STEM (science, technology, engineering, math) fields. Much of the research has relied upon theories that address the marginalization of the African American population in relation to the social context: marginality, subculture/ethnicity, discrimination, acculturation, and opportunity.

However, another potential perspective that warrants consideration and expansion is exploring the role of the educator, including both formal and informal educators. This research approach, in regards to the educators' awareness, approaches, and dispositions of implementing environmental education (EE) along with collaborating and working independently within natural sites (both on and off campus), is imperative to understand. Thus, the purpose of this project will be aimed at determining whether a new potential

factor, the role of the educator, exists and should be considered with the previously identified causes within social context to introduce the outdoors for those marginalized populations with environmental inequality, injustices, and cultural disconnections.

People of color have historically been marginalized and experienced barriers preventing their population from equal access to educational and professional opportunities. While a 2008 report from the National Action Council for Minorities in Engineering acknowledges minority participation in STEM fields has increased in the last three decades, the gains do not approach equality compared to their presence in the U.S. population and new constraints, most notably the digital gap, are being constructed that are preventing access to opportunities including those with the STEM fields. The root of the problem can often be traced back to all grade levels in which fewer and fewer minorities are having direct contact with individuals within STEM fields as institutional resources continue to be budgeted in such constrained methods that performance in math and science compared to other developed countries continues to be low. Math and science are mentioned as they are the fundamental skills that are necessary for STEM careers. Examples of constrained budgets would include low income districts having less opportunity for field trips to wild-land and natural sites or the development of placed-based education such as outdoor classrooms on school sites.

Emerging in the mid 1990s, researchers began suggesting multicultural environmental education, a fusion of multicultural education and environmental education, as a possible solution to helping resolve these growing trends. Simply opening up the doors of opportunity to accessing and introducing minority students to the outdoors would aid in more native born students, including marginalized people of color,

entering STEM fields. While using the outdoors as the impetus to increase academic achievement has been around for decades, thanks in large part to curricular resources that include cultural themes such as Project Learning Tree, Project Wet, Project Wild, and the National Wildlife Federation's Schoolyard Habitat Program; it has only recently been looked upon as a means to connect to the rising interest in multicultural educational curricula aimed at teaching the skills needed by students for the 21<sup>st</sup> century.

Interestingly enough, a study by Cordell (2012) that was compiled for the United States Forestry Service, examined participation patterns within managed natural settings and noted that marginalized groups such as African Americans and Hispanic/Latinos had low rates of participation, yet these same groups are predicted to represent the majority of the U.S. population in the near future. This prediction is important for two reasons. First, it is forcing public land managers to expand opportunities and connections to adjust to preferences for marginalized populations and how they use the land for recreational purposes. Secondly, as competitive funding increases, the predictions serve as the means to assist educators in strategizing and developing new programs and initiatives including appropriately designed outdoor classroom settings and curricula targeted toward attracting a more diverse population.

### **Research Purpose and Significance of the Study**

In an effort to assure all people have equal opportunity to learn and develop interest about the environment within a world that is becoming increasingly diverse, the environmental and outdoor settings are the ideal arena to develop the goals of environmental education –knowledge, skills, attitudes, and behaviors - that would potentially lead to increased STEM field participation by racial minorities. While prior

research has been explored that connects low participation by marginalized groups in natural settings to factors related to the critical race theories of oppression in reference to poverty, the role of educators in how they correlate to the issue has not been deeply examined. While U.S. national security, health, and competitiveness is at risk due to under-participation by racial minorities within STEM fields, it seems plausible to explore the role of educators and their contribution in helping to assuage the problem. A report from the National Science Foundation (2005) described that one of the causes of this low STEM participation is due to less opportunity because of social injustices within marginalized groups in being introduced or having access to natural settings. Thus, if one of the roles of educators, as outlined by Joseph, Bravmann, Windschitl, Mikel & Green (2000) is “academic rationalism (p. 11)”, or “enabling the young to acquire the tools to participate in the Western cultural tradition (p. 10)”, then it seems only logical to examine how teachers fit into this dichotomy if the family setting due to oppression is unable to offer the opportunity. Through an exploration of local educators at schools and nearby urban wilderness settings, a better understanding will be gained regarding knowledge of the identified issue and constraints that prevent educators from using natural settings at the schools and local sites to help connect marginalized students to the outdoors.

### **Major Research Questions**

Several main questions were examined to guide this study and included:

1. Do formal educators (classroom teachers) and informal educators (educators at the natural sites) differ in their levels of awareness of low racial minority participation in outdoor learning settings and STEM fields and the factors that affect their participation?

2. How are formal and informal educators (educators at the natural sites) connecting with each other? Are informal educators reaching out to local schools and/or are formal educators aware of the sites and opportunities at those sites?
3. What barriers (logistical - time, money, institutional - curricular, administrative support, and EE goal barriers - dispositions/knowledge/personal experience/comfort level of educators) are formal and informal educators facing that prevent them from using the outdoors?
4. What are the perceptions of educators regarding educational policy, race/ethnicity and multicultural education in connection with using the outdoors to educate?

### **Conceptual Framework**

#### **Critical Theories of Oppression Related to Race**

The majority of studies that exist that could potentially be utilized to construct a credible hypothesis on the lack of diversity within the STEM fields and environmental science focuses mainly on theories of oppression, the barriers and constraints that prevent racial minorities from visiting, participating, and enjoying specific realms of outdoor recreation. The prevalent theories include marginality, subculture/ethnicity, discrimination, acculturation and opportunity (Carr & Williams, 1993; Chavez, 2000; Laven, 2008; Stanfield, Manning, Budruk, & Floyd, 2005) and fall within critical theory by exposing issues related to oppression and power by the dominant culture.

The marginality hypothesis suggests that under-participation in outdoor recreation by racial minorities is due to historic discrimination that has left people of color without the resources to visit parks and recreational areas. The specific resources identified include limited financial assets, lower levels of education, and limited employment.



Marginality has also been identified as a constraint that leads to disadvantages such as fewer recreational opportunities, lack of access to transportation, underdeveloped program availability, knowledge about where parks are located, internal (entrance fees) and external (gas, food, etc) costs, and a lack of interpretation in parks relating to minority history and culture.

The subculture/ethnicity theory purports that outdoor recreation and wilderness experience fall outside the cultural norms, social organizations, socialization practices and value systems of racial and ethnic minorities. Values or norms can include size of recreational groups, preferred activities, and developmental level of sites – rustic setting versus facilities oriented areas.

Discrimination theory results from overt and/or institutional discrimination from interpersonal interaction with other visitors or with agency personnel within a recreational area. The acculturation theory focuses on the relationship of cultural assimilation and the recreational choices of the majority culture. For example, as racial minorities are assimilated into the majority culture, their recreational use patterns will be similar to those of the majority group; however, currently, while White participation with outdoor areas is still primarily the majority, the overall trend has been a pattern of decreased visitation across the board for all ethnic groups which is resulting in further reduced visitation levels by people of color.

Opportunity is examined by researchers as the relationship of recreational sites to residential location of racial minority populations and their preferences for recreation. The constraints coinciding with these theories include, but are not limited to, time and money as the most common logistical factors (Johnson, Bowker, Cordell, 2001).

## **Summary**

This chapter provided the background for the intended study, the purpose and significance of the research, and the specific research questions. A conceptual framework provided the context for the study within the larger body of literature and provided clarification of the research questions and overall goals for the study. Chapter Two will present the related review of literature, and Chapter Three will discuss the methodological justification and specific techniques used for the study. Chapter Four will present the data and Chapter Five will summarize the study, discuss implications of the study and offer recommendation for future research and professional practice.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

In the modern age of technology and information along with increased globalization, the lack of multiculturalism within STEM fields, including those professions within the environmental science sector, has placed critical awareness of the risk on U.S. national security, health, and competitiveness. While those that have been tasked with the responsibility of identifying the problem have looked at causality related to cultural oppression issues such as socioeconomics in terms of critical race theory, the role of educators and how critical race is intertwined within the educational system is also imperative to examine and infuse into the explanatory contentions. This review of literature will explore under-participation by racial minorities within the outdoors and natural areas with specific focus on racial minority outdoor recreational preferences, educator barriers in teaching environmental education in natural areas, contributing factors within the educational system related to critical theory, and strategies used by outdoor/natural area land managers and educators to address increasing diversity.

#### **Definition and Background of Environmental Education**

A working definition for environmental education (EE) has continuously evolved over the last forty years. The original terminology of EE rose out of the environmental movement of the late 1960s being defined first by Dr. William Stapp of the University of Michigan in 1969 and originally appearing in Dr. Clay Schoenfeld's "Journal of Environmental Education" (McCrea, 2006). Dr. Stapp's definition stated:

“environmental education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution” (Stapp, 1969, p.30). McCrea (2006) notes that because EE was still emerging at this time, the definition was not seen as definitive.

One of the most widely accepted definitions of environmental education (EE), supported by the United States Environmental Agency, was adopted by the United Nations Educational, Scientific, and Cultural Organization Conference (UNESCO) held in Yugoslavia in 1975 (EPA). The Belgrade Charter, as it was known, outlined EE as a learning process that increases people’s knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action (EPA; Thomson & Hoffman, 2003). Following the Belgrade Charter was the world’s first Intergovernmental Conference on Environmental Education held in Tbilisi, Georgia in 1977 (EPA). One of the major outcomes from this conference was the formation of the objectives of EE. Thomson and Hoffman (2003) noted that most environmental educators have since universally adopted these objectives that include: Awareness, Knowledge, Attitudes, Skills, and Participation. Lee and Williams (2001) expanded the definitions of education about the environment. These included cognitive understanding involving the development of skills necessary to obtain this understanding, the use of real-life situations as a basis for inquiry learning, and assisting the preservation and improvement of the environment by creating attitudes, concern, and a predisposition that enhances the quality of life. Their work also included

three principle aims of EE: providing a basic understanding of the major ecological systems of the planet, developing feelings for the Earth and its life, and encouraging changes in behavior so that people live more in harmony with the natural world.

In summary, EE is a learning theory that involves learning through experience by using the environment as the integrating theme, context, and often the setting. The term environment must be noted as everything around us, including man and man-made structures. The operative goals of EE then are to demonstrate 1) the impact man has on everything around us, including nature; 2) how the independent and dependent systems of the world are being affected; 3) how man is a part of nature and the environment and not just in nature; and 4) the environment components of man must work together to make sustainable decisions. These sustainable decisions, utilizing the skills, attitudes, knowledge, and behaviors of environmental lessons must be taken in account in order to balance the social, economic, environmental factors that impact our world.

While EE may be a relatively newer term in relation to the actual theory of using the environment as the integrating context, the concept of EE has fundamental roots dating back to the 17<sup>th</sup> century. Several early philosophers such as Comenius, Rousseau, Pestalozzi and Froebel are recognized as the early influences incorporating the natural outdoors as an integral part of children's educational curriculum (Desmond et al. 2002; McCrea, 2006; & Subramaniam, 2002). Comenius, the 17<sup>th</sup> century philosopher, believed that education should be universal, optimistic, practical and innovative and should focus not only on school and family life but also on general social life. He has often been referenced as promoting the notion that a school garden should be connected with every school, children can have the opportunity for leisurely gazing upon trees, flowers and

herbs, and are taught to appreciate them. Jean-Jacques Rousseau emphasized the importance of nature in education in that “nature was the child’s greatest teacher” and “knowledge of the natural world serves as a foundation for later learning”. Rousseau’s teachings were adopted by Johann Heinrich Pestalozzi who started a school for orphans using gardening, farming, and home skills as practical education. Froebel emphasized “doing” within nature and became one of the most effective early proponents of school gardens. Louis Agassiz encouraged his students to “study nature, not books”, thereby learning directly from experience.

More recently in the 20<sup>th</sup> century leading up to the EE movement of the 1960s, Dewey was promoting EE in the form of experiential learning. John Dewey’s teachings on the utilization of agriculture in education in 1915 propelled the first wave of school gardens in the United States (Desmond et al., 2002). These school gardens were often referred to as victory gardens during WWI, but the practice continued post-war. In his “School and Society”, Dewey supported experiential education outside the school for the utilization of agriculture in education. While early environmental education was closely linked to the tenets of the original nature theory, in which nature is good for us; proponents today advocate for EE as an educational learning theory.

Bleyker (2011), outlines eight educational theories that environmental education through experiential and participatory methods of delivery now correlates to: Vygotsky’s sociocultural cognitive theory and the Behavioral Social Cognitive Theory (knowledge constructed through interactions); Gardner’s Multiple Intelligence Pedagogy (cultural and setting connects with learning and affects intelligences); the Humanist Theory (human need for nature); Critical Thinking Pedagogy (explore complex questions and answers to

imbalances of social justice, poverty, and power); Erikson's Psychosocial Theory (desire to connect with other people/cultures), Bronfenbrenner's Ecological Theory (learning influenced by environmental systems such as the microsystem, mesosystem, exosystem, macrosystem and chronosystem); The Constructivist Theory based on Dewey and Piaget (create meaning from experience); Brain Based Pedagogy (make connections and learning meaningful); and Pedagogy of Bloom's Taxonomy (scientific method).

### **Status of Environmental Education in South Carolina**

In 2013, the North American Association of Environmental Education (NAAEE) published a status report of state environmental literacy plans from their 2012 survey. State environmental literacy plans (ELPs) were outlined as "comprehensive frameworks that support school systems in expanding and improving environmental education programs (p. 2)". A total of 47 states and the District of Columbia successfully completed the survey with South Carolina being one of the three states that did not have a representative to respond to the survey. However, major findings included: 14 states have completed and adopted environmental literacy plans, 73% of states reported that their state EE association plays an active role in ELPs, 88% of states are using NAAEE's "Developing a State Environmental Plan" publication as a reference, and 67% stated their state department of education was supportive.

Personal contact provided information about an early EE attempt in the state during the height of the environmental movement of the 1960s. South Carolina had begun the process of developing an environmental literacy plan in 1960 through a grant from the Baruch Foundation and under the direction of State Superintendent of Education Dr. Jesse Anderson. Experimentation of the curriculum was conducted during the 1966-

1967 academic year. The experimental use of “People and Their Environment” by the Conservation Curriculum Improvement Project, as it was called, was embraced and accepted by the South Carolina State Superintendent of Education, Cyril Busbee, at that time; however, what became of this project and the eight curriculum guides that were developed is not known.

With regards to whether state EE associations play an active role in EE, The Chesapeake Bay Foundation No Child Left Inside Coalition lists South Carolina as utilizing the Environmental Education Association of South Carolina (EEASC) as the umbrella organization to exchange and share information and ideas to policy stakeholders. Secondly, while there are not any current statutes or bylaws, it is reported that efforts are in place; however, the notion of efforts being defined as “in place” is construed as being somewhat vague. This vagueness can easily be exemplified in that nationally recognized EE curricula, Project Learning Tree, Project Wild and Project Wet, have all been listed in a follow-up 2004/05 to the Status of Environmental Education Programs in the United States study from 1998 as being “In Place” as curriculum programs with EE aligned with state standards (NAAEE) for South Carolina. However a state comprehensive EE plan is not “In Place” (NAAEE).

A deeper exploration revealed, via the Campaign for Environmental Literacy, that South Carolina is not reported as having a by-law or requirement for K-12 EE instruction, does not require EE teacher training prior to teacher certification or licensing for teaching certain subjects connected with EE, does not have assessments that include EE, and does not have formal EE learner objectives and outcomes.



In February of 2014, results from NAAEE's 2013 survey became available, through personal contact, in which a representative from South Carolina did participate. It was indicated that South Carolina is in the early stages of developing an ELP, the Environmental Education Association of South Carolina (EEASC) has taken the lead role in the ELP development, it was unknown whether the state department of education was supportive of this ELP development, and EEASC was supportive of both informal and formal environmental education. Unfortunately, ample data was unavailable due to the respondent leaving many of the queried items unanswered. It is not known why the submitted survey was incomplete.

### **Racial Minority Outdoor Recreational Preferences**

Secondary to the theories of oppressions in reference to why people of color are under-represented in the outdoors correlating to a lack of racial minorities in the STEM and environmental field are studies by researchers that identify the exact preferences of racial minorities in regards to outdoor recreation participation. Ironically, Johnson, Bowker, and Cordell (2001) summarized that racial minorities indicated outdoor recreation as one of the most important needs in their respected communities, ahead of more urgent needs such as housing and job opportunities, yet their patterns of usage for outdoor recreation continue to decrease. While research similar to this might demonstrate a racial minority need for nature, it is extremely limited and the term 'outdoor' needs to be specifically defined. However, the majority of the existing available research pertaining to this dilemma focuses more heavily on the constraints that suggest why racial minorities are under-represented in outdoor recreation along with racial minority outdoor preference and do not make a connection to the emerging theories

that everyone has an internal need for nature and what it is that is preventing us from fulfilling that need.

While it arguably can be assumed that people from all demographic groups participate in some form of outdoor recreation fulfilling our need to be in nature (nature possibly referring to any type of outdoors), participation patterns are extremely different. In studying participation patterns among people of color versus Whites, researchers have found similar patterns that demonstrate racial minorities have more of a propensity to participate in outdoor recreation that consists of natural landscapes that are maintained or have constructed facilities instead of immersion into wilderness and undeveloped settings. Payne, Mowen, and Orsega-Smith's (2002) research indicated that racial minorities were significantly less likely than Whites to prefer wild-land recreations settings. Their research also found that racial minorities did not prefer settings with dense vegetation or confinement but preferred instead natural environments that are open, well-groomed, and have more structured amenities such as ball fields and paved trails. They concluded that racial minority preference was geared more towards interracial contact as an important predictor of leisure preferences. Johnson, Horan and Pepper (1997) earlier indicated that racial minorities are less likely to engage in wild-land recreational activities such as camping, hiking, or backpacking along with unstructured-type settings, such as wilderness settings, and were reported as having fewer visits and less favorable impressions about wild-lands mainly due to the different meanings different racial groups attach to the term wild-land. Johnson, et. al. (2001) also revealed that people of color are less likely than Whites to recreate in dispersed settings or to travel to regional recreation areas. Chavez (2000) reported racial minorities tend to

participate in outdoor recreation in large groups in structured or specific areas and often preferred urban outdoor recreation experiences. Baas, Ewert, and Chavez (1993) further reported that Whites were reported as having higher participation rates in ‘active’ outdoor recreation activities such as hiking and camping, winter sports, and water skiing due to accessibility to sites and equipment.

Conceivably, a way to further connect participation preferences is the notion of how racial minorities perceive nature. Johnson and Bowker (2004) reported that many Whites viewed wild places as spiritual, sanctified refuges or an escape from human modification, therapeutic landscapes or having the power to recreate the human spirit. Racial minorities, however; in particular African Americans, may view wild-lands as sick places evoking horrible memories of toil, torture, and death, slavery/plantation agriculture labor, sharecropping, lynching, forest work camps, and exploited Black labor. These views, then, possibly connect to the oppressive enforced theories that further explain why racial minorities have negative perceptions and under participate in outdoor recreation in terms of wild-lands versus structured natural settings.

Participation by racial minorities within natural settings, specifically within urban areas is also due to the issues that connect with poverty, the characteristics of the surrounding urban environment and environmental injustices which ultimately transcends beyond the cultural setting and segues into the educational realm.

### **Barriers to Teaching Environmental Education in Natural Areas**

The benefits of environmental education have been well documented and EE has been suggested as a means to introduce more racial minorities to the outdoors through education in order to help assuage the issue of under-representation within outdoor

recreation participation and professions. Some of the most widely known and researched benefits of using natural settings for education are increased cognitive skills such as creativity, problem-solving, focus, self-discipline, physical competence, social skills, confidence, and emotional and intellectual development (Burdett & Whitaker, 2005; Chawla, 2006; Kellert, 2005; Malone & Tranter, 2003; Rickinson & Sanders, 2005; Malone, 2008). Environmental knowledge, gains in environmental behavior and connection to the natural environment, all important goals of EE, have also been shown to be benefits of using natural areas as the integrating context (American Institutes for Research, 2005; Dymont, 2004; Malone, 2008). However, while the benefits of EE are unambiguous, the paths into environmental education that the educational system can provide beginning with the educators themselves may be the solution that is needed in connecting more racial minorities to the outdoors and overcoming the constraints that prevent these groups from participating in outdoor recreation due to cultural environmental issues at home.

As indicated earlier, researchers have focused extensively on the current status of minority populations and their outdoor choices and slightly less on the dispositions of educators involved with teaching environmental education, if the opportunity exists. James and McAvoy (1992), state there are three routes for racial minorities to work within the environmental profession: an interest in science, positive experience in the outdoors ranging either from the extreme, such as backpacking trips, to simple excursions like playing in neighborhood parks, and recognizing the effects of environmental degradation upon a particular community – all that can potentially be accomplished within the school setting when using the environment as the integrating context. The

starting point then that is needed to provide opportunity for these pathways is through recognizing the role of educators and the learning experiences that they can provide, if assuming they hold within their dispositions the goals of EE – skills, knowledge, behaviors, and attitudes. In support of this notion, Ewert, Place, and Sibthorp's (2005) study reinforces earlier research in that "early childhood outdoor experiences are related to environmental views. Participation in early-life appreciative (ex. scenic viewing, bird watching) outdoor activities, participation in early-life consumptive (ex. gem mining) outdoor activities, exposure to media events focusing on environmental issues and witnessing negative environmental events are all related to adults' current beliefs concerning the environment" (p.234). Thus, exposing more racial minorities more often to the outdoors is crucial in developing a new and larger generation of people of color within environmental education. To do this effectively however, schools are challenged with employing educators with the skill set that not only motivates students in outdoor settings, but are comfortable themselves in providing sound learning opportunities.

Simmons (1996) found that teachers viewed science as the most appropriate subject to teach in local, urban wild-land and natural settings; however, this is contingent upon being able to overcome logistical barriers within the educational system. Common barriers to successfully implement place-based outdoor learning in correlation to teacher edification include fear and concern about health and safety; teachers' lack of confidence in teaching outdoors; school curriculum requirements; shortage of time (perceiving interconnections of EE and other subjects), resources, and support; and wider changes within and beyond the education sector along with demographical factors such as ethnic and cultural identity and the setting (Dillon et al., 2006; Powers, 2004). Furthermore,

Powers (2004) summarized in her findings that student disposition, specifically an aversion to science and to being outdoors, was noted, along with time, as one of the most significant barriers for educators teaching environmental education. Simmons (1998) expanded her earlier research and found that urban wild-land settings and natural areas were more appropriate for teaching environmental education; however, with more risk, given the educators are able to extend the classroom beyond the school property. Findings also revealed that educators had only a moderate amount of confidence and expressed a higher need for training if they were to use urban wild-land settings. This is important as the issue of using the onsite educators was not explored if comfort level by the formal educators themselves was low in regards to being outdoors and teaching. Moseley, Reinke, and Bookout (2002) stated that after seven weeks of teaching environmental education, self-efficacy dropped significantly by elementary teachers with possible causes being cited as time and a lack of prior exposure themselves within outdoor settings. Besides motivation, one crucially unexplored cause of this could be attributed to the issue that teachers have no extended specialized or personal training in EE and are merely generalists within science education regardless of whether they view EE as a separate or integrated subject.

One of the first factors that is integral in investigating how educators can motivate and introduce more at-risk students to the outdoors are the dispositions of those educators faced with teaching EE. This is especially important in impoverished areas with predominant racial minority populations specifically when pre-service educators develop from their prior knowledge and experience, new understandings and meanings within their environment as related to cultural differences. Lane's (1994) research reported that

the absence of an EE background and the notion that EE is unrelated to subject disciplines are the main reasons educators do not teach about the environment. Almost two decades later, Moseley and Utley's (2008) research found a similar trend in that pre-service teachers saw "EE only as an extension of the science and social studies standards that they are required to teach and not as a separate discipline in teaching" and that "pre-service teachers need to become more aware of how their teaching beliefs shape their teaching practice" (p.25). Perrutta, Moseley, and Cantu (2008) also found a very similar pattern in their study of pre-service teachers in that they "do not have a clear understanding of the components of the environment and how these components interact in a systematic way" (p.14), which is crucial in order to teach EE. Both studies found a very interesting similarity in that ethnicity does not predict pre-service environmental literacy; however the authors of both studies state that cultural backgrounds influence teacher backgrounds and that ethnicity has not been examined deeply – specifically African American groups. Both studies examined Hispanic cultures while African Americans were not queried. Thus, a correlation of pre-service knowledge about EE and the relation to African American educators should be explored when considering the theories of oppression that often prevent participation.

In regards to in-service educators, findings replicate those of pre-service. In a study of only in-service educators, Ernst (2007) found the strongest barriers to implementing EE were: emphasis on state testing, lack of funding, lack of planning time, emphasis on state standards, and lack of transportation. A counterpoint to the barriers that some educators face is the notion that some educators are more committed to teach EE and attempt to overcome those barriers. Shuman and Ham's (1997) research

indicated that EE life experiences during childhood, college and adult years prove influential in teachers commitment to teach EE and their probability that they will overcome existing barriers; however, this research is obviously contingent upon whether the educator has prior experience within EE and natural settings. Adding to experiences, but in terms of providing them to students, Simmons (1998) found that teachers felt it was important to provide natural experiences as part of the EE curriculum and students would enjoy them along with being confident they would know what to do with their students; however, there was an overall belief that teachers were less certain about their comfort teaching in these types of settings, did not feel they were well trained to teach in natural settings, and wanted more training if they took their students to these types of place based learning sites. Ko and Lee (2003) support this notion in their research in that teachers tended to teach more EE if they had more skills of teaching EE and there were fewer constraints.

One of the most salient themes identified in terms of barriers was the issue of policy. Studies by Powers (2004) and Heimlich et. al. (2004) both indicated that policy within federal, state, and local school districts impedes EE implementation. Policy is crucially important within EE specifically when accounting for race and ethnicity as it is the nucleus that correlates to critical race theory.

### **Contributing Factors Related to Critical Theory**

Tyack (1974), Kozol (2005), and MacLeod (2008) all argue that policy and economics dictate what occurs within our educational system specifically when the topics of race, ethnicity, social networks and socio-economics are added to the discussion. Furthermore, their premises argue that due to the dominant power structure of



government by affluent Whites, schools that are lower academic achieving and typically have large racial minority and impoverished students are the ones that are denied the larger percentages of resources necessary for improvement. In terms of policy, race, and EE, Lewis and James (1995) identified seven misconceptions that are still prevalent in EE today: 1) people of color are not interested in environmental issues; 2) historically, people have not been involved in environmental issues, resulting in a scarcity of people of color who can serve as role models in EE; 3) the issues receiving primary attention in EE curricula like wilderness ecology and preservation have universal appeal compared to environmental injustices such as pollution and toxins like pesticides; 4) people of color are not interested in pursuing careers in EE; 5) the needs of people of color are recognized and addressed by those setting the EE agenda – people of color have not been integrally involved in planning and implementing EE; 6) EE programs are presented in way that appeal to all audiences; 7) environmental educators should initiate and facilitate a discussion of the EE agenda by people of color. Their foremost suggestion was a need to recognize the diversity of environmental issues facing all students of color through a need to recognize the social, economic, and political issues interrelated with environmental issues. James (1996) noted that the most common barriers for minorities to participation within environmental work beyond cultural barriers echoed the research of Lewis and James and included: lack of exposure to nature or natural settings, job information, and factual information about environmental issues; a lack of support and failure of environmental organizations to address community issues including a perception that diversity was not an organizational priority; and racial stereotypes and racism regarding perceptions that minorities were not interested in environmental issues.

The No Child Left Behind Act has placed immense pressure on educators and academic achievement with an awareness that the two subjects that minorities, specifically African Americans, are falling behind in compared to Whites are math and science: the two subjects that are extremely crucial to STEM fields. The disparities of math and science scores of racial minorities has a negative effect on low STEM field choices and low levels of college preparation and success that is needed for entry into these fields (National Science Foundation, 2005; Frehill, DiFabio, & Hill, 2008; Harper, 2010; Warwick Institute for Employment Research, 2011). Despite this, EE has been shown to increase academic achievement specifically within math and science, both of which can successfully be taught within natural settings (Liebermand & Hoody, 1998). However, James and McAvoy's (1992) research demonstrated the first two routes for racial minorities to work within the environmental profession as an interest in science and positive experience. Success through increased science and math scores along with nature interest will potentially only increase if hands-on work beyond the classroom in a natural setting exists. This is extremely interconnected to the whole issue at hand.

This phenomenon, known as the achievement gap between Whites and racial minorities, has explanations from problems associated with lower teacher qualifications, insufficient amount of diverse teachers, a lack of differential resources, low family involvement, and student apathy and disengagement (Milner & Ford, 2005) all of which are perpetuated and enhanced within largely racial minority and impoverished settings. As a means to mitigate these barriers, Seaman, Beightol, Shirilla, and Crawford (2009), recommend contact with cross-group interaction, a tenet within contact theory that must include four conditions necessary for positive outcomes: participants from diverse

groups must perceive they have equal status, common goals must be worked on interdependently, opportunity for association, and normative support of authorities must be experienced. A caveat must be noted here in that curricular resources and power structure must be examined in terms of ensuring interest is of equal status.

Compared to their White counterparts, the disparities experienced by racial minorities that decrease the opportunity for environmental education involvement are a focus of an extension of critical theory. Known as critical race theory, this theoretical work examines issues of race in education such as privileges that White students experience and place them at an advantage over racial minorities when empirically examined (Milner & Ford, 2005). Milner, (2007) quotes the work of Solorzano and Yosso (2001), that critical race theory “challenges the dominant discourse on race and racism as it relates to education by examining how educational theory and practice are used to subordinate certain racial and ethnic groups” (p.390). Other advantages enjoyed by Whites as noted by Milner and Ford (2005) include that positions of authority and power in education that are dominated by Whites, the curriculum and its lack of focus on people of color, a lack of diversity in illustrations in books and reading materials, few multicultural books in the library, and traditional teaching styles with little attention to other ways of imparting knowledge. These examples can be extended to the environmental education arena, due in large part of the original issue at hand of low racial minority involvement.

When examining the disparities between math and science scores of Whites and racial minorities in reference to using the environment as the integrating context, barriers must be examined, specifically when race and inequality in access to the outdoors is

involved. Barriers associated with racial minority students in impoverished areas and those schools include, as referenced by Baldwin (2004) “less access to formal learning opportunities, more serious physical and mental health problems, and more environmental barriers that affect their education (p.110)” that ultimately lead to decreased environmental opportunity. For example, Larson, Castleberry, and Green’s (2010) research indicated an interesting pattern in that 83% of African American children who reported spending a majority of time outdoors actually spent that time someplace else in a social setting like basketball versus almost 70% of White children who stated they simply spent it alone in their backyard. This research then connects to access, safety, and opportunity based on the qualitative data outlined in the study. To help mitigate this issue, Stevenson et. al. (2013) advocate increased time in nature at school for racial minorities as their study indicated that while white student environmental literacy was positively impacted when having teachers with advanced degrees that used time outdoors and EE curricula, minority environmental literacy was negatively impacted as there were less teachers available with advanced degrees to teach in areas dominated by African Americans. They surmised this disparity was partially explained by socio-economic status of poverty versus culture and the constraints that are associated with access and opportunity to natural areas especially when looking at the Title 1 schools within their study. One crucial element of their study, the curriculum, needs to be further reviewed in terms of race.

Lewis and James’ (1995) work reported a pattern that still has shown little improvement today in that EE curricula focus mainly on the values and lifestyles of a select group, in this case the white, middle-class students, which in turn creates barriers

to diversity in EE programs. When looking at who creates the EE curricula and identifying the trend that it is largely authored by White educators, the constraint that is becoming increasingly evident and popular in cultural anthropology research is that of language, specifically a lack of African American language in the curriculum. Thus, a cultural connection to EE for people of color must be established along with placing more racial minority educators in positions of leadership and empowerment as a means to avoid the ideology of culture-blindness, a concept in which the assumption that equity is achieved only by ignoring cultural difference. Hudson (2001) and Bowers (2001) both emphasize the notion that a diverse audience for EE not only needs to include the audience in the process, but also address linguistic translation. This is interpreted as how EE themes and issues are presented in terms of connections to diverse audiences and written style of English, as a means to create what Milner (2012) petitions as a way to avoid interest convergence of the policy matters that white faculty and administrators often control.

In essence, recommendations have been consistently suggested that would attempt to advance EE within racial minority cultures in order to alleviate the inequality that is observed among various ethnic groups. Thus, issues like who is publishing EE curricula and how they perceive barriers such as language were incorporated within the Environmental Education and Training Partnership (EETAP, 1999) which recommended several factors that were essential for racial minority students to have a role in EE. These are still for all intents and purposes recommended today and include: the importance of teachers researching student cultures and incorporating the sharing of student viewpoints in order to infuse these perspectives into EE themes that are taught in order to have a

local connection, and the essentiality of awareness in identifying and accommodating different learning styles of diverse cultures as they may affect how students backgrounds process information. What is inherently being suggested as a social justice impetus is the infusion of multicultural themes with environmental education; however, this strategy is not receiving the attention warranted to prepare the next generation of racial minorities for environmental and STEM leadership.

### **Multicultural Environmental Education**

Research that dates back to at least 1985, including that of Bowman and Shepard, indicates that natural land managers were aware of low racial minority participation within the natural resource arena. Researchers increasingly began focusing on demographic changes within EE as the 21<sup>st</sup> century approached and commonalities appeared within recommendations that overwhelmingly included concentrating on the hegemony of the power structure of the dominance that Whites had within the field. Prevalent standard recommendations included adding diversity within EE with the formerly mentioned barriers being recognized. Others researchers such as Davis (1998), Warren (2002) and Agyeman (2003) include the connection to critical race theory within their studies and advocate for social justice within EE. Essentially, the propositions they promote are collectively known as multicultural environmental education.

Due to the shared values that both multiculturalism and EE have in common, researchers have been supporting the notion of blending the two (Matthews, 1992; Taylor, 1996; Marouli, 2002; Siegel, 2002; Nordstrom, 2008). EETAP (2000) advocates for the infusion of the two for the factors emphasized in the afore-mentioned review that school curricula needs to reflect culture, experiences and perspectives.

A necessary task for policymakers to achieve in order to construct appropriate policy reflective of successful ‘multicultural environmental education’ practice is to understand that the two disciplines, while seemingly separate, actually consist of congruent ideologies. Multicultural education (ME) consists of several integral, defining points often referring to two practices according to Nordstrom (2008): teaching in a multicultural society and teaching about cultural diversity. However, in a broader sense, ME includes a holistic perspective, emphasizes value clarification and promotes democratic principles of equity and social justice including communication and intercultural dialogue. This enables students from diverse ethnic, racial and social-class groups to experience educational equality in such a way that if ‘ME seeks to make pupil’s identity stronger, the environment must be taken into account’ (Nordstrom, 2008, p.135). Consequently, EE is a multi-discipline line of teaching and learning that educates individuals to become more knowledgeable about their environment and to develop responsible environmental behavior and skills in order to work for improved environmental quality. This can be accomplished by facilitating personal as well as social change and it fundamentally values education at the core, or in other words, cultural processes as a central faction of environmental knowledge (Nordstrom, 2008). EE is ineffectively indoctrinated without consideration of social aspects specifically in an increasingly multicultural world, hence a combination of the dyads produces multicultural environmental education.

The term ‘multicultural environmental education’ was coined in the early 1990s, originating from environmental justice movement and borrowing from multicultural education of which little has been researched and written about since its conception. Yet,

Marouli (2002), addresses the need to link the cross curricular themes of EE and the cross curricular dimensions of multicultural education of which multicultural environmental education succeeds in accomplishing. “Multicultural environmental education refers to increased access of culturally diverse – not only the dominant – groups to environmental education and increased representation of their worldviews in it” (p28).

Nordstrom’s (2008) research indicates seven values as common characteristics between the two ideologies: diversity, belonging, respect and compassion, justice and equality, empowerment, societal reform and lastly, global perspective. A summary of Nordstrom’s points are shown below:

- Diversity - losing biodiversity puts in danger people’s life styles, and consequently, cultural diversity
- Belonging - re-engaging culture and ecology creates an ethic anchored in the recognition of interdependence due to the close connection that people once shared with the natural world; while place-based pedagogy directly links to the social and ecological well-being of the places people actually inhabit and encompasses indigenous and democratic education.
- Respect and Compassion – In order to preserve the integrity of the ecosphere and ensure the survival of us all, people must learn how to empathize with each other, and how to extend compassion to people in other lands, to other species and to future generations.
- Justice and Equality – Curricula of MEE should question cultural patterns that privilege certain social groups and environmental exploitation over others and provide the understanding of how to participate in the process



of creating a socially more vital community.

- Empowerment – Building inner motivation and self-esteem aims to provide children with knowledge and skills that will help them to solve existing problems (environmental and social) at both the local and global level and to avoid generating new ones.
- Societal reform – a sustainable future and equitable standard of living for all people can only be achieved if legislation reflects a concern for ecologically sustainable development and distributing social justice.
- Global perspective – an ideology based on values education, on human rights and moral obligation, this viewpoint aims to show the desire of ME and EE to promote knowledge of global issues and to understand the interrelatedness of all systems and societies in the world; thus a central attempt to help children to understand their close interconnection with other individuals, nations and species, how their daily actions influence other parts of the world and how international events in turn affect their lives.

### **Summary**

This chapter has reviewed the relevant literature that provides the theoretical framework for the study with the primary themes used to support the research questions including: 1) racial minority outdoor recreational preferences; 2) educator barriers in teaching environmental education in natural areas; 3) contributing factors within the educational system related to critical theory; and 4) multicultural environmental education as a new strategy. The following chapter will outline the research

methodology employed including overview of the sample population under investigation and data collection and analysis techniques to be utilized for the purpose of addressing the research questions.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **Type of Study and Methodological Approach**

The study was designed around the methodological approach that categorizes it as a collective case study using multiple sites. In qualitative inquiry, according to Glesne (2011), a case study “refers to the intensive study of a case” “that is a bounded integrated system with working parts” (p.22). The case for this study revolved around examining educators’ environmental education dispositions at low income, majority African American populated schools in close proximity to three urban wilderness sites that offer environmental education. A collective case study “allows investigation of a phenomenon, population or general condition (Glesne, 2011, p.22). While this sounds somewhat complex, in essence, the school sites and urban wilderness sites were hypothesized as being part of an overall issue in which both have components that should be working together in regards to the issue under study. Because the focus of this study was to develop a rich descriptive analysis of a specific case and its purpose was to understand causality related to “how” and “why” questions and not simply “what” and “where” inquiry, this method was appropriate to address the qualitative and quantitative data collection processes, mixed methods, designed for this study. A second rationale for using this method was based on the fact that a case study can incorporate mixed methods within one of the components of data collection – surveys.

Motivation for using mixed methods has been described by Small (2011) as being either for confirmation or complementary with the later being the rationale behind the purpose of employing more than one kind of data collection for this study. This study was constructed around the concept of “using either textual or small-sample (qualitative) data to interpret the results derived from large-sample (quantitative) data” (Small, 2011, p.65). The type of inquiry and data collection methods that guided this study within mixed methods falls closely within sequential explanatory design. Wurtz (2009) describes the key elements of sequential explanatory design as collecting mainly quantitative data followed by qualitative with the priority given to the quantitative. The purpose of the qualitative data is used to help explain the quantitative data and integration usually occurs in the interpretation phase of the study. The design included qualitative focus groups to support the mixed methods survey design framed around the critical theory paradigm of research.

Johnson and Onwuegbuzie (2004), noted that mixed methods, due to its logical and intuitive appeal, is conducted because “its logic of inquiry includes the use of induction (or discovery of patterns), deduction (testing of theories and hypotheses), and abduction (uncovering and relying on the best of a set of explanations for understanding one’s results)”. These methods were deemed appropriate as the methodology that has been chosen as the goal of the study falls within the intention of critical theory research: “detecting and unmasking of beliefs and practices that limit human freedom, justice, and democracy (Glesne, 2011, p.9)” and critical theory research does not follow any particular set of methods – thus the mixed methods approach allowed for the opportunity to infuse the prevalent theoretical perspectives of oppression that limits minority

participation rates within the outdoors and connects to the more salient critical race theory. Mixed methods, specifically constructed within the survey, allowed for known phenomenon, such as logistics and barriers that prevent minority outdoor participation, to be combined with identifying potential previously unknown processes such as educator attitude, skills, knowledge, and dispositions within low income areas.

While qualitative methods such as focus groups allow for rich description to be captured that would allow an understanding of underlying reasons to the issue; a survey with a mixed format of qualitative and quantitative questions was utilized as the most appropriate method based on the large population of interest. Surveys offered integral data components to an area with limited prior collected data. Surveys were also a good starting point because of the potential length of this study with future extensions and because collected data from a targeted population about perceptions and opinions about the issue at hand are a phenomenon that can not be directly observed. Lastly, as the aim was to provide data to the organizations in order to suggest recommendations, results from the study needed to be conclusive versus simply generalizations. As the focus was trying to find causation and certain patterns, it was essentially exploring a real life phenomenon within real situations and a survey with qualitative and quantitatively designed questions offered “different aspects of the phenomena” and “reduces the risk that conclusions will reflect only the biases of a specific method” (Maxwell, 2013, p.102).

This type of inquiry allowed a better understanding of how formal educators are using local resources, what institutional and dispositional issues constrain their ability to use the outdoors, and what recommendations can be made to assist them in ways to better

prepare them and improve their practice to allow equal student access to the outdoors.

The inclusion of the proposed actions is an important tenet of critical theory as this critical ethnography study is concerned with “praxis, or the relationships between thought and action, theory and practice” (Glesne, 2011, p.10).

### **Site Selection, Criteria, and Justification**

Due to demographic statistics indicating that Richland County, South Carolina has an almost equal percentage of Caucasians and African Americans, and the area has local natural areas representing both state and federal entities; Columbia, South Carolina was selected as the city location for this study based on theoretical sampling. While convenience sampling could be argued due to the location being situated in the proximity of the researcher, theoretical sampling was a more rational choice because of the various educational opportunities that each site offers through multiple approaches; therefore, a wide range of rich data connected to the issue should be able to be collected. Based on prior observations and knowledge of similar sites around the area, it was theorized that these sites have strong connections to local schools due to location proximity near an urban area and are able to offer more educational opportunities for educators and students with less constraint.

With diversity being an integral part of the study at hand, homogenous sampling was utilized to determine sites with similar, but specific characteristics to collect data that would hopefully provide enhanced understanding of the problem at hand through the perceptions of those in the field observing the issue. Three sites, chosen through pre-selected criteria (being familiar by the researcher in terms of opportunities, landscape design, usage, and to some degree visitation patterns), were identified with a variation of

demographics represented and school visitations occurring. Since a lack of diversity within the outdoors and wilderness settings is a core component of the larger problem, the three sites represented areas where these events are hypothetically expected not to be occurring in regularity or high percentages consistently based on prior observations by the researcher. Due to their close proximity to downtown Columbia, South Carolina, and nearby schools, more security and comfort (open spaces, shelters) due to being an urban natural area, and having educational opportunities; the following sites were determined: Harbison State Forest on the western edge of Columbia, Sesquicentennial State Park on the northeastern edge of Columbia, and Congaree National Park on the southern edge.

**Table 3.1: Logistical Comparison of Natural Sites**

Natural Site	Managing Agency	Size	Fees	Miles of Trails for Hiking
Harbison State Forest	South Carolina Forestry Commission	2135 Acres, Piedmont Habitat - Mixed Hardwood, Loblolly, Longleaf, & Shortleaf Pine	No Fees for School Groups Visiting for Educational Purposes	18 miles for mixed usage
Sesquicentennial State Park	South Carolina Parks Recreation & Tourism	1400 Acres Sandhills Habitat – Turkey Oak & Longleaf Pine, some bottomlands	\$2 for Adults, 15& Under –Free	Approximately 5.8 miles set aside from mountain biking
Congaree National Park	United States National Park Service	27,000 Acres – Coastal Plain Habitat – Bottomland/riparian Forest of Cypress, loblolly pine	No Fees	Approximately 27.4 miles for hiking

**Table 3.2: Environmental Education Comparisons of Natural Sites**

Natural Site	Available Indoor Classroom	Available Outdoor Covered Classroom	Type of Trail Surface	Available Self Guided Tours	Available Ranger Guided Tours	Available Junior Ranger Program	Ranger Led Programs
Harbison State Forest	Yes, no fee	Yes, multiple	All Natural	Yes	Yes	No	Yes
Sesquicentennial State Park	Yes, but requires fee	Yes, multiple	All Natural	Yes	Yes	Yes	Yes
Congaree National Park	Yes, no fee	Yes, one	Natural & Boardwalk	Yes	Yes	Yes	Yes

Aside from location, other criteria used to separate the sites from generic outdoor recreational sites, such as city and county parks, for this study include: an available land manager and environmental educator, various educational opportunities aligned with state standards, a natural setting without athletic fields or courts; the inclusion of paved and unpaved trails, and boardwalks; tree identification and educational signage/maps; isolated wilderness areas; public shelter and picnic venues; on-site security/law enforcement personnel; and high visitation patterns. These sites theoretically offered enhanced data due to the sites being operated by different entities (South Carolina Forestry Commission, South Carolina Parks & Recreation, and the National Park Service) with different approaches to their environmental educational priorities, missions, goals, staffing, opportunities and budgets.

### **Participant Selection, Criteria, and Justification**

Aside from the educators and land managers at the chosen sites, participants for this study were educators who represented elementary level schools that are in close proximity to the study sites – a homogenous sampling method. Rationale for choosing these participants was based on the notion that it was surmised that educators, specifically science teachers, nearest to these sites would be less constrained by logistics and would be more familiar with the sites and knowledgeable about opportunities. Elementary school teachers were selected since outdoor settings connect easier with the standards and curriculum at this level without specialization being needed. It was also theorized that the site educators and managers may have contacted the nearby schools to offer their services. It was estimated that the number of educators, that should provide a sufficient amount of data would be approximately 100+ teachers. Those that participated in the



data collection by completing the survey fall within “convenience sampling” (p. 56) simply due to availability and willingness to participate at the time of survey administration (Fink, 2009). Due to time constraints in scheduling survey administration, probability sampling methods did not occur. Originally, largely minority, low income elementary schools in closest proximity to the three natural sites were selected; however during the district request for research application process, one district denied the request as two of the desired schools were closed for research. In essence, the schools that were chosen for the project represented low income elementary schools with a majority African American student population versus large majority.

The following graph represents the selected school study sites and demographical information detailing the percentage of African American students, percentage of eligibility for subsidized lunch, number of students, teacher to student ratio, and percentages of male & female students.

**Table 3.3: Selected Study Site Demographics**

School	Number of Students	% African American	District Spending Per Student	Subsidized Lunch Eligibility	Teacher Student Ratio & Total # of Teachers	Grade Level & # of Teachers on Team	% Student Gender
Bridge Creek ES	567	67.5%	\$9,612	64.6%	19:1 30	K-6 1-6 2-5 3-5 4-4 5-4	53.3%F 46.7% M
Lonnie B Nelson ES	516	65.1%	\$9,612	54.3%	18:1 32	K-8 1-5 2-5 3-5 4-4 5-5	52.7%F 47.3% M
L. W. Conder ES	747	75.9%	\$9,612	71.5%	18:1 50	K-11 1-10 2-10 3-7 4-6 5-7	52.3%F 47.7% M

## **Methods**

As this study is a multi-site case study, collection of data from all educators was conducted through a cross-sectional survey that contained qualitative and quantitative questions. While results should differ based on the type of question, the perspectives should compliment each other. Qualitative questions were used as the research does not fully indicate whether educators are truly part of the causality of the issue at hand and a new approach may be suggested based on unexpected results. Quantitative questions were included in order to understand to what degree educators are aware of the issue, potential constraints to resolving the issue, knowledge of available opportunities, and perceptions on how race and policy factor into the issue. All collection of data from these individuals was conducted at the sites for their comfort level as it was the most non-threatening environment for this sensitive issue.

The survey was administered first with a letter of consent (Appendix A) and definition of terms (Appendix B). The survey instrument (Appendix C & D) contained demographic, quantitatively designed questions including closed, multiple choice, and Likert type questions combined with open ended questions to fulfill the qualitative aspect. Survey terms were simplified from standard definitions reviewed from valid sources: Environmental Education Training Partnership, North American Association of Environmental Education, and U.S. Fish and Wildlife Service. Surveys for formal educators had a total of 31 questions: 4 demographic, 10 closed, 7 multiple choice, 7 Likert type, and 3 open-ended. Natural site educator surveys had a total of 25 questions: 4 demographic, 4 closed, 8 multiple choice, 6 Likert type, and 3 open-ended. Both

surveys had options for additional comments on closed, multiple choice, and Likert type questions.

A survey was used as the means to test the hypothesis contained in the research questions quickly and cost effectively while gathering descriptive information that can be analyzed statistically in order to show potential relationships and comparisons among variables including possible cause and effect. This method was also used in order to provide numerical descriptive analysis that can be compared with future surveys in order to identify possible trends and relationships. All participants had the option of being involved in focus groups after completing the survey as a means to gather qualitative data that expands upon the open-ended responses to questions contained within the survey in order to identify patterns within setting, context, or time.

The survey, including defined terms, was piloted for reliability and validity prior to being administered to the sample population. The pilot survey was administered to a stratified sample population of teachers with the following characteristics: professional teaching/work relationship with the researcher, prior experience in a low income public school, and knowledge of the issue to be researched. Prior contact with the research sample population was made with the goal of being able to administer the survey during a faculty/employee meeting where the highest number of respondents would hopefully be in attendance.

Ideally, after the survey, an opportunity for a maximum variation sampling of teachers to meet in a focus group was given, through means of a sign-up sheet, as this would have been an opportunity to reflect on the survey questions and new ideas would potentially be generated. The focus group was proposed to meet at that school in an area

most comfortable for the educators. However, due to the previously stated logistic, time, this was unable to occur as there were no participants .

However, a second strategy that was employed was that available informal educators were invited to participate in a focus group after the survey and again due to time and unforeseen circumstances, this was the only extension of data collection beyond the survey that occurred. With the three focus groups that did occur, participation was limited by time and availability. Due to less than four natural site educators being at a focus group session, the format was very relaxed with lots of flexibility and free flow and no standard rules. Each session was designed to last approximately 45 minutes and was framed around one question: What were your thoughts on the issues queried in the survey?

### **Data Analysis**

Data analysis methods for this project were determined by whether the survey questions tied to each major research question and overarching theme were quantitative or qualitative. Hence, multiple survey questions from both surveys were used to answer each major research question. The quantitative portion of the data, which fell within categorical data as the data was not measured on a continuous scale and distinctions were made between groups, was analyzed through SPSS software resulting in descriptive statistics depicting frequency charts and graphs. Further analysis of the categorical data occurred by cross tabulating several questions in reference to whether ethnicity or age played a role with respondent answers. These statistics were gathered and analyzed through the use of Chi square which resulted in whether relationships between variables occurred. The Chi-square test was used as it is a means to identify whether there was an

association between two categorical variables: for example, was there an association between ethnicity and perception that there is a lack of diversity within outdoor recreation. With the Chi-square test are two basic hypotheses: the variables are not associated (they are independent) or the variables are associated (they are dependent).

The more daunting task was analysis of the qualitative data. Several methods were used. First, open-ended questions were analyzed based on content in order to infer the meaning of responses. This was accomplished by meticulously reading over responses and attempting to find patterns based on the “presence of certain words, concepts, themes, phrases, characters, or sentences” and placing the responses into categories (Fink, 2009, p. 89). The focus group sessions were transcribed as soon as possible after the initial session in which notes were taken. The purpose of this was to begin developing patterns and new questions.

Survey questions related to memorable childhood outdoor experiences and current outdoor participation patterns were categorized into the following constructs: Organized Camps, Family Activities, Managed Area/Walking Activities, Outdoor Adventure Activities (such as hiking, kayaking), Hunting/Fishing, and Organized Sports (tennis for example). Camping was assumed to be car/RV camping based on the assumption that wilderness camping would have been conveyed as backpacking. For Likert type questions, coding was used to look for patterns and connections that could be placed into descriptions that could be connected to an overall theme of theory, policy, and practice.

In summary, the data analysis process was theoretically used to “look for relationships that connect statements and events within a context into a coherent whole” (Maxwell, 2012, p.113) with the purpose of addressing the research questions.

### **Role of the Researcher and Limitations**

In terms of my role as researcher for this project, I must acknowledge the many opportunities in my background that have prepared me to use the outdoors to teach. The tools that I refer to are the “tools” of environmental education. These include four key components: skills, knowledge, behavior, and attitude. As an outdoor enthusiast my entire life with graduate level education related to the environment, prior employment experience within the outdoor and environmental field, and current teaching employment with autonomy to construct curriculum around the outdoors, it is logical to say that I have an edge in terms of the tools necessary to teach within outdoor classrooms. I have lived in Columbia, SC; located in Richland County where all study sites are situated, for almost twenty years. I have mountain biked and hiked continuously at all natural sites to be researched in that time frame. I feel with this experience, I “know” the sites and what they have to offer. Because I “know” these sights, I am consciously aware of who is visiting these sites when I am present. I have had informal conversations with some of the site educators and have learned that in general, teachers are not taking full advantage of opportunities that are available. In light of what I do and am trying to accomplish in my own place of employment in terms of being a resource for teachers, conversations with the districts and natural site contacts leads me to believe that I am a viable researcher for this project and there was no other contemporary research being done at the time at the sites related to this project area of focus.

However, as a researcher in this area, I must recognize my limitations. Based on outdoor preferences of those that are of interest within the scope of this study, I am an outsider to their culture; therefore collected data must have the caveat that is from the

perspectives of those that typically are viewed as having control over these groups. Thus, one of the challenges is the fact that the group I am potentially researching is very different from my own personal demographic which is described as middle class, White male with graduate degree level education. The main group to be researched is representative of a racial minority culture that is often viewed as “outside the norm” of typical outdoor/wilderness participation and STEM field careers. This marginalized group is mainly African American, from low socioeconomic status, does not view the outdoors/wilderness in the same manner on the cultural norm based on acculturation theory, and does not have the opportunity, experience, means, and equipment to participate. While I do not personally know the participants or have any personal power over them, it is assumed that with my role as a White male, I hold a dominant position in society and thus will most likely be considered as the one with power in this situation. In a positive sense, the power in this situation could be viewed as a means to be more connected with possible opportunity of networking resources not typically available.

### **Situated Knowledge and Related Assumptions**

Having participated in environmental work and outdoor recreation in the area to be studied for almost twenty years, observations made by this researcher suggest that oppressions and poverty has left the marginalized population and schools in impoverished areas little means for accessing the opportunities available in the area in regards to environmental and outdoor settings. Observations have also been subconsciously noted in terms of a lack of diversity at environmentally themed workshops and conferences. It is also assumed, based on observation, that the marginalized population does not want to be in areas that are deemed ‘wild’ versus

managed landscapes as it is simply not part of their interests. This could hold true for racial minority educators perhaps due to a lack of exposure to the outdoors that limited the development of the necessary skills, knowledge, attitudes and behaviors that are necessary for enjoyment and understanding of natural systems. Due to inequalities related to majority Caucasian schools versus schools with a majority of racial minority students, it was assumed that teachers with quality prior experience, skills and knowledge of the outdoors and a lack of educator diversity also contributes to the problem. This is due to the rationale that schools performing well above the achievement gap are able to recruit and retain educators with outdoor skills as well as allow them the ability to use the outdoors within the curriculum. Lastly, it is assumed that due to a lack of positive experience while young, older marginalized individuals (including racial minority educators) have no desire to participate in these settings specifically when connections to their culture are unable to be established. These assumptions have been molded from existing literature on the topic in terms of preferences of outdoor recreation preference by marginalized populations along with observations made as an environmental educator that uses the outdoors to educate.

Based on the above information, hypotheses have been formulated for the four research questions to be explored for this study and are briefly discussed below:

1. Do formal educators (classroom teachers) and informal educators (educators at the natural sites) differ in their levels of awareness of low racial minority participation in outdoor learning settings and STEM fields and the factors that affect their participation?

It is surmised from the formal introduction of the topic at Francis Beidler Forest and from personal observation that natural site educators are largely aware of the issue. It



is further assumed that the hierarchy of funding with the Federal government and Congaree National Park representing the highest level, followed by the South Carolina State Parks, and then lastly, the South Carolina Forestry Commission are actively working on strategic plans to assuage the situation.

In terms of formal educators, it is perceived that many of the educators that are employed at low income, largely minority schools will be highly representative of younger and less experienced educators specifically employed at these schools in order to gain experience and mobility with little knowledge regarding the issue. It is also assumed that because of this younger demographic representing a new generation of teachers heavily influenced by the technology age, there may be a disconnect from the outdoors and the nature of the issue due to the detachment from nature that technology creates.

2. How are formal and informal educators (educators at the natural sites) connecting with each other? Are informal educators reaching out to local schools and/or are formal educators aware of the sites and opportunities at those sites?

It is assumed that time and funding along with available staffing prevent natural site educators from fully connecting with local schools. Connection is estimated to be minimal, about once every approximately two years and contact being made to just a few key individuals at schools – science teachers and/or administrators. Based on prior observations and conversations, it is conceived that formal educators are minimally aware of opportunities – those opportunities being the basics such as guided tours and available picnic areas. Because contact between the sites and schools is estimated to be minimal, educators are probably not fully aware of the available programs and opportunities.

3. What barriers (logistical - time, money, institutional - curricular, administrative support, and EE goal barriers - dispositions/knowledge/personal experience/comfort level of educators) are formal and informal educators facing that prevent them from using the outdoors?

Based on extensive experience in this field, it is theorized that time and funding are the biggest overall constraints followed by the notion that many educators consistently state that they must “teach to the test” referring to the idea that they must only cover skills and material that will be included on standardized testing. For personal constraints, it is theorized, based on the theories of oppression, that personal comfort and experience in natural sites are the biggest hurdles that are faced by minority educators.

4. What are the perceptions of educators regarding educational policy, race/ethnicity and multicultural education in connection with using the outdoors to educate?

It is hypothesized that educators (formal and informal) overwhelmingly support EE but are divided as to whether policy and race constrain the allowance of these programs. It is also assumed that most educators, due to the popularity of multicultural education and EE since the 1990s, are aware that the two echo each other in their goals. It is also believed that most educators feel they have some training. This training is also believed to include some sort of knowledge about available EE training due to the influx in programs, workshops, and curricular resources that have been constructed in the last two decades since the rise in technology.

Overall, it is perceived that most educators agree that the role of the educator plays a role in the issue at hand with the rationale being that educators themselves are constrained by the policy of “teaching to the test”.

### **Survey Response Return Rate and Demographics**

For this project, a survey was administered to formal educators at three low income, majority populated minority elementary schools and compared to responses from a survey of similar fashion to informal educators at three local natural sites. The surveys contained a mixture of questions that were forced choice, multiple choice, Likert scale-like questions, and open ended. The survey was test piloted and designed to investigate whether educators play a role in introducing the outdoors to marginalized students. Four major research questions provided the basis in which the survey was constructed and included:

1. Do formal educators (classroom teachers) and informal educators (educators at the natural sites) differ in their levels of awareness of low racial minority participation in outdoor learning settings and STEM fields and the factors that affect their participation?
2. How are formal and informal educators (educators at the natural sites) connecting with each other? Are informal educators reaching out to local schools and/or are formal educators aware of the sites and opportunities at those sites?
3. What barriers (logistical - time, money, institutional - curricular, administrative support, and EE goal barriers - dispositions/knowledge/personal experience/comfort level of educators) are formal and informal educators facing that prevent them from using the outdoors?
4. What are the perceptions of educators regarding educational policy, race/ethnicity and multicultural education in connection with using the outdoors to educate?

Administration of the surveys began the last week of February, 2014, with the natural site visitations after initial contact was made with individuals from each park. The Harbison State Forest main contact was the Education Director in which the researcher was familiar with. The park supervisor was the lead contact at Sesquicentennial State Forest. Both locations did not require a permit to conduct research, only basic information about the project itself including the amount of time required was needed before permission was granted. The process for Congaree National Park was slightly more difficult. The researcher worked through the Human Resource Director to file an application for a permit request through the National Park Service. Within two weeks, permission was granted and visitation was allowed.

Harbison State Forest (HSF) personnel were able to be scheduled first and had the fewest amount of staff employed and qualified to participate in the research project due to budgetary constraints. The researcher was available to administer the survey at HSF and was conducted in a conference room. After the letters of consent were distributed and the project and process was conveyed and started, only one question arose. This question was in reference to question number 8 whether specific grade levels were needed. The answer provided was no specifics were necessary. One survey was eliminated as the respondent did not complete the survey – over 50% of questions were left unanswered. Three completed surveys were deemed viable for the project. A focus group was held immediately after respondents were completed with the surveys. Two employees were able to participate in the process. Participants from HSF included a ranger, educator, and land manager with the later two engaging in the focus group.

Following the site visit to Harbison State Forest, the next scheduled visitation occurred at Sesquicentennial State Park (SSP) on two separate occasions the first week of March, 2014. Again, the researcher was present to administer the letters of consent and surveys at the main park office and visitation center within several interior offices that adjoined each other. There were no days available in which all qualified park employees would be present to participate; however, over two visits, five personnel were able to complete the surveys. On both visits, the participants were willing to collaborate in a focus group after completing the survey. Three staff participated on the first visit and two employees on the subsequent visit. SSP qualified employees that took part in the survey process and focus groups included an educator, two rangers, land manager, and park maintenance supervisor. Due to the maintenance supervisor having multiple responsibilities, including observing and interacting with visitors, he was deemed qualified to participate.

The last natural site visitation occurred at Congaree National Park during the last two weeks of March. Again, there was not a day in which all qualified personnel would be available. In this case, an alternative route was conducted. On the first visit the researcher was available, two staff members were able to be present and both participated in the focus group after completing the survey in the visitation center conference room. Copies of the survey were then left with the Human Resource Director who emailed staff about the topic of the research project (diversity and environmental education) encouraging personnel to assist in the process if time allowed for it. Surveys were not picked up for one week. Five more staff members completed the surveys and overall this included one educator, four rangers, and two “other” categories – park director and chief

interpretive ranger. On the day the completed surveys were collected, no staff were available for a focus group and no additional comments were provided.

Overall, there were fifteen of 22 (68%) total natural site educators and qualified staff that participated in the project in which all participants were Caucasian. Commonalities existed at all sites in that all participants were generally interested in the project and park leaders wanted to obtain the overall results of the project upon completion. The majority of natural site educators that participated in this project were representative of the under 40 age bracket (86.7%) and 40% had less than 6 years of experience. All natural site employees were considered educators despite multiple professional labels. This included one maintenance supervisor that was deemed an acceptable participant. The rationale stems from the fact that this individual, as a park employee, was a steward of the green site first and foremost with the main goals of educating the public and protecting the natural space. Therefore, because this individual consistently interacted with guests and answered questions, he was aware of diverse groups that frequented the site. This individual was also integrally involved in the implementation of strategies at the site, such as a paved trail in a managed area of the park, that were designed and constructed with the purpose of increasing diverse populations' interactions near the wild-land areas of the park that are under-represented by diverse groups in these settings.

After the natural site data collection portion of the project was completed, collection of data from formal educators at the elementary schools began during the second half of March through the first half of April. Initially, the proposal for this project was designed around the natural sites in which the closest proximity low income, largely

minority elementary school was to be researched. However, one school district denied the initial request for research and later, two other schools in the district that approved research were closed for research. In response, the district contact identified three schools that fit the parameters of low income elementary school with a majority population of African American students in close proximity to one of the natural sites that were willing to participate in the project. The original schools were Hopkins Elementary School, Pine Grove Elementary School and Windsor Elementary School. Alternatively selected schools that participated were Bridge Creek Elementary School, Lonnie B. Nelson Elementary School, and Conder Elementary School.

Bridge Creek Elementary School was able to be scheduled first, followed by Lonnie B Nelson, and then Conder. Only one site, Lonnie B Nelson, was able to accommodate the researcher in allowing time to be present during a faculty meeting to introduce the project. However, time constraints again played a part and surveys were then left for educators to complete over the course of one week. At the other two sites, Bridge Creek and Conder, the researcher sent a brief informative email to the principal that was forwarded to all staff at the schools. Upon arriving at the school sites, the researcher met with the principals formerly to discuss the project specifics. Letters of consent and surveys with definitions were then left at each site for one week.

Overall, 75 of 113 (66%) educators from the three schools participated in completing the surveys that were deemed viable for this project in the sense that the majority of the survey was complete: 21 from Bridge Creek, 22 from Lonnie B Nelson, and 32 from Conder. Basic demographics from this sample set included 45 educators that represented Caucasians (61.6%), 27 African Americans (37%) and 1 Asian (1.4%).

A majority, (63.5%) of teachers at these schools were under the age of 40. Only 12 (17.6%) of the 75 participating educators fell in the range of 50+. The majority of educators (58.1%) had less than 11 years teaching: 31.1% had 0-5 years of experience and 27% had 6-10 years of experience. Contrary to this, educators that were theoretically exposed to the direct lessons of the environmental movement of the 1960s represented only 13 educators (17.6%): 11 in the 50-59 year range (14.9%) and 2 in the 60+ year range (2.7%). Eleven educators (14.9%) had over 20 years of experience.

**Table 3.4: Comparison of Educators' Age**

Age Range	Formal Educators' Frequency & Percentage		Natural Site Educators' Frequency & Percentage	
22-29	22	29.7%	7	46.7%
30-39	25	33.8%	6	40.0%
40-49	14	18.9%	2	13.3%
50-59	11	14.9%	0	
60+	2	2.7%	0	
Total	74	100%	15	100%

**Table 3.5: Comparison of Educators' Level of Experience**

Years of Experience Range	Formal Educators' Frequency & Percentage		Natural Site Educators' Frequency & Percentage	
0-5	23	31.1%	6	40.0%
6-10	20	27.0%	4	26.7%
11-15	11	14.9%	3	20.0%
16-20	9	12.2%	1	6.7%
20+	11	14.9%	1	6.7%
Total	74	100%	15	100%

**Table 3.6: Comparison of Educators' Ethnicity**

Ethnicity	Formal Educators' Frequency & Percentage		Natural Site Educators' Frequency & Percentage	
African American	27	37.0%	0	
Asian	1	1.4%	0	
Caucasian	45	61.6%	15	100%
Hispanic/Latino	0		0	
Native American	0		0	
Other	0		0	
Total	73	100%	15	100%



This chapter outlined the methodological plan for the study including the type of study and methodological approach; the site selection, criteria, and justification; the participant selection, criteria, and justification; and the methods and data analysis procedure. Details regarding the strengths and limitations for the specific techniques utilized were discussed and related situated knowledge and assumptions guiding the research were reviewed. Lastly, survey return response rates and demographics are included.

## **CHAPTER FOUR**

### **RESULTS & ANALYSIS**

In this chapter, I summarize the results of the formal educator and natural site educator surveys organized according to the four main research questions that guided this study:

1. Do formal educators (classroom teachers) and informal educators (educators at the natural sites) differ in their levels of awareness of low racial minority participation in outdoor learning settings and STEM fields and the factors that affect their participation?

2. How are formal and informal educators (educators at the natural sites) connecting with each other? Are informal educators reaching out to local schools and/or are formal educators aware of the sites and opportunities at those sites?

3. What barriers (logistical - time, money, institutional - curricular, administrative support, and EE goal barriers - dispositions/knowledge/personal experience/comfort level of educators) are formal and informal educators facing that prevent them from using the outdoors?

4. What are the perceptions of educators regarding educational policy, race/ethnicity and multicultural education in connection with using the outdoors to educate?

The following results are a summary that connect specific survey questions to each major question. For the purpose of this study, a majority is defined as a representation of over half of the sample set. A strong or large majority is defined as a

representation of over 75% of the sample set. Each major research question was correlated to specific questions on both formal and natural site educator surveys. The following chart displays which survey questions connect to each major research question.

**Table 4.1: Correlated Survey Questions to Research Questions**

<b>Major Research Question</b>	<b>Formal Educator Survey Questions</b>	<b>Natural Site Educator Survey Questions</b>
<b>Question 1</b>	5 - 7	5 - 7
<b>Question 2</b>	8 - 13	8 - 13
<b>Question 3</b>	14, 19, 20	14, 16, 17
<b>Question 4</b>	17, 18, 24-26	21 – 23
<b>Major Theme: Support of EE/Role of Educator</b>	21-23, 27-29, 31	15, 18-20, 25

### **Research Question 1 Results: Perceptions of Racial Minority Participation**

The first research question asked: Do formal educators (classroom teachers) and informal educators (educators at the natural sites) differ in their levels of awareness of low racial minority participation in outdoor learning settings and STEM fields and the factors that affect their participation?

Results indicate that formal educators are divided on whether they feel a lack of diversity exists within outdoor recreation. Over 37% of formal educators responded that there is a lack of diversity in outdoor recreation and over 40% responded that there is a lack of diversity in STEM fields and other outdoor professions, while 36.5% and 27%, respectively, disagreed. Approximately 25% of formal educators reported “unsure/unknown” in terms of their awareness level related to diversity and outdoor recreation participation along with about 32% when queried about STEM field diversity and other outdoor professions.

In comparison, more than 73% of the natural site educators responded that they believed diversity issues existed within outdoor recreation, and about 66% in reference to

diversity within STEM fields and other outdoor professions. Approximately 20% of natural site educators responded they did not believe a diversity issue exists within outdoor recreation while about 13% reported they did not believe diversity issues exist within STEM fields and other outdoor professions. Only 6.7% were unsure to outdoor recreation diversity issues with uncertainty increasing to 20% when queried about STEM field and other outdoor professions diversity issues.

Regarding barriers that constrain minorities from visiting and participating in outdoor recreation at natural sites, about 17% of formal educators responded “I do not perceive a lack of minority participation in outdoor settings”, while only about 5% of these same educators were unsure of barriers. Two barrier choices were checked by a majority of formal educators: lack of knowledge in what the parks offer and lack of funds. A strong minority of formal educators’ responses included: a lack of access (48%), lack of parental involvement (44%) and a lack of time (36%) were barriers. About a quarter of formal educators felt that a lack of previous opportunities from role models (28%), lack of knowledge of park locations (26.7%), park visitation is outside the norm (25.3%) and lack of previous knowledge/experience about the natural world (25.3%). Two choices were chosen by less than 10% of formal educators as barriers: visiting a managed landscape is preferred (5.3%) and park staff is discriminatory (2.7%).

In contrast, no natural site educator responded that they did not perceive of a lack of minority participation in outdoor settings and only 13.5% were unsure of any barrier. A majority of natural site educators chose three barriers that influenced a lack of diversity in outdoor recreation: a lack of connections to the historic/cultural role of minorities in these settings (53.3%), lack of previous knowledge/experience about the natural world

(66.7%), and a lack of previous opportunity from a role model to take/teach outside (60%) were potential causes. A strong majority responded that visiting the park is outside the culture norm, practices, and values (80%), and a fear of the natural world in these types of settings (86.7%) were possible barriers. Lastly, a strong minority indicated a lack of knowledge in what the parks offer (46.7%), lack of funds to visit (46.7%), visiting a managed landscape is preferred (46.7%), lack of parental involvement (40%), and lack of access (33.3%) as constraints to outdoor recreation participation.

### **Research Question 1 Summary of Results**

Results for the first research question indicate formal educators and natural site educators differ in their perceptions and awareness regarding diversity in outdoor recreation participation and STEM field/outdoor professions. A majority of natural site educators perceive the issues exist while a strong minority of formal educators believe in the issues. For the most part, these educators were dissimilar in their perceptions of what barriers constrained minority participation in outdoor recreation. However, there were five barriers that had a less than 10% margin of difference: lack of knowledge in what the parks offer, lack of funds to visit, lack of diversity within the park, park staff is discriminatory, and lack of parental involvement. The following tables provide frequency distribution and percentages of responses to survey questions to answer the first research question.

**Table 4.2: Perceptions of Lack of Diversity Within Outdoor Recreation**

Response	Formal Educators'		Natural Site Educators'	
	Frequency & Percentage		Frequency & Percentage	
Yes	28	37.8%	11	73.3%
No	27	36.5%	3	20.0%
Unsure/Unknown	19	25.3%	1	6.7%
Total	74	100%	15	100%

**Table 4.3: Perceptions of Lack of Diversity Within STEM/Outdoor Professions**

Response	Formal Educators'		Natural Site Educators'	
	Frequency & Percentage		Frequency & Percentage	
Yes	30	40.5%	10	66.7%
No	20	27.0%	2	13.3%
Unsure/Unknown	24	32.4%	3	20.0%
Total	74	100%	15	100%

**Table 4.4: Perceptions of Limitations for Minority Participation in the Outdoors**

Limiting Causes	Formal Educators'		Natural Site Educators'	
	Percentage		Percentage	
Do Not Perceive Issue Exists	17.3%		0%	
Lack of knowledge in what the parks offer	53.3%		46.7%	
Lack of access – no park nearby and no transportation	48%		33.3%	
Lack of connections to the historic/cultural role of minorities in these settings	17.3%		53.3%	
Lack of knowledge of park locations	26.7%		13.3%	
Lack of funds to visit	52%		46.7%	
Lack of diversity within park	16%		20%	
Park visitation is outside the culture norm, practices, & values	25.3%		80%	
Visiting a managed landscape is preferred	5.3%		46.7%	
Park staff is discriminatory	2.7%		6.7%	
Lack of previous knowledge/experience about the natural world	25.3%		66.7%	
Fear of the natural world	20%		86.7%	
Lack of previous role model to take/teach outside	28%		60%	
Lack of parental involvement	44%		40%	
Lack of time	36%		13.3%	
Unsure/Unknown	5.3%		13.3%	

## **Research Question 2 Results: Communication and Logistical Awareness**

The second research question asked: How are formal and natural site educators connecting with each other – are natural site educators reaching out to local schools and/or are formal educators aware of the sites and opportunities at those sites?

More than 89.3% of formal educators correctly identified the nearest natural site to their school on the survey. In contrast to this, 60% of natural site educators correctly identified the nearest low income, largely minority school to their site, while over 33% of these educators were unsure.

Half of formal educators have not been contacted by an educator at a natural site; however, about 25% stated they were contacted and approximately 12% stated the school was contacted and information was given to them. This equates to over 37% of formal educators that received park information via some form of communication with the school. About 11% formal educators were unaware of any communication or had not received any. About 60% of natural site educators have not initiated contact; however, of the natural site educators that responded that they initiated contact, the most often used method was a personal site visit to the school (46.7%). If a natural site educator initiated contact, the most recent time frame was within 6 months and longest attempt was 4 years ago. When attempts are made, they ranged from once a month to once a year.

A majority of formal educators (56.1%) were aware of both the educational opportunities and fees, while 31.7% stated that they were only aware of the opportunities, resulting in 87.8% of educators that had some knowledge about what the parks offer and/or the absence of fees. A small percentage of educators were not aware of fees or opportunities – 12.2%. No formal educators were aware of fees only.

All opportunities and resources are being used at the natural sites according to the responses from formal educators. The most common response in which natural site opportunities were utilized was as a site for a picnic with schools (41.3%). In terms of park resources, the most common response was that the park was visited for a fieldtrip for science using park educators (24%).

All natural site educators (100%) responded they had observed their site being used for science related activities using park educators. A majority of natural site educators (66.7%) also observed diverse populations using the park for outdoor classrooms, for festivals/celebrations/special events (73.3%), and as a picnic area (73.3%). A large majority of park employees stated they observed guided nature walks (93.3%) with a park educator being used as a resource.

### **Research Question 2 Summary of Results**

A strong majority of formal educators are aware of the nearest natural site to their school while a majority of natural site educators know of the nearest low income, minority student populated school to their site. While half of formal educators have not been contacted by natural site educators, a strong minority had some type of contact. Most natural site educators have not contacted any formal educator; however, of those that had, a personal visit was the most common approach. A strong majority of formal educators are aware to some degree of natural site opportunities and fees while all opportunities and resources at natural sites are being used.



**Table 4.5: Familiarity of Natural Site Educational Opportunities and Fees**

<b>Park Fee/Opportunity Knowledge Content</b>	<b>Frequency And Percentage Formal Educators</b>	
Aware of Fees & Opportunity	23	56.1%
Aware of Opportunities, Not Fees	13	31.7%
Aware of Fees, Not Opportunities	0	
Not Aware of Either	5	12.2%
Total	41	100%

**Table 4.6: Educators' Park Usage Compared to Observations**

<b>Natural Site/Park Usage</b>	<b>Formal Educator Response Percentage of Opportunity Usage at Natural Sites</b>	<b>Natural Site Educator Response Percentage of Observed Usage by Formal Educators</b>
Fieldtrip for science using park educators	24%	100%
Fieldtrip for science not using park educators	16%	40%
Fieldtrip for other subjects using park educators	8%	26.7%
Fieldtrip for other subjects not using park educators	6.7%	40%
Park educator visited school	17.3%	33.3%
Have not used park site for educators as a resource	16%	0%

**Table 4.7: Educators' Park Opportunities Usage Compared to Observations**

<b>Natural Site/Park Usage</b>	<b>Formal Educator Response Percentage of Opportunity Usage at Natural Sites</b>	<b>Natural Site Educator Response Percentage of Observed Usage by Formal Educators</b>
On-site indoor classroom activities/presentations	14.7%%	33.3%
On-site outdoor classroom activities/presentations	29.3%	66.7%
Guided nature walks with park employee	25.3%	93.3%
Self guided nature walks with educational information	24%	33.3%
Festivals, celebrations, special events	21.3%	73.3%
Picnic	41.3%	73.3%
Park Not Used As Resource	32%	0%

### **Research Question 3 Results: Barriers to Using Outdoor EE Settings**

The third research question asked: What barriers (logistical, institutional, & personal) are formal and informal educators facing that prevent them from using the outdoors?

Over 42% of formal educators stated barriers do not keep their school from visiting a natural site, while only 12% were unsure. All barriers to visiting a natural park site had less than 18% of formal educators indicating them as a constraints, while six barriers were chosen by less than 7% of respondents. No formal educator responded a lack of support from administrators as a barrier.

Compared to formal educators, natural site educators responses increased significantly. Only 6.7% of natural site educators felt there were not any existing barriers. A large majority of natural site educators (86.7%) perceived that a lack of school funds for transportation, entrance fees, etc were still a barrier. A majority of natural site educators also felt that a lack of student funds for field trips (53.3%) and a lack of knowledge related to opportunities at the site (53.3%) were constraints to visiting. A strong minority of natural site educators also indicated the following at barriers to visiting natural sites: lack of personal comfort level (46.7%), lack of personal experience in these types of settings & lack of interest both at 40%, and a lack of support from administrators and teachers at 33.3%. A quarter of natural site educators felt a lack of positive student behavior was a constraint. Natural site educator responses were lower in several areas compared with formal educators: lack of time and a lack of connections to the curricula.

Almost half of formal educators (42.7%) felt there were not any existing barriers for allowing EE at their schools. The most common barriers chosen were by a strong minority: lack of time (34.7%), lack of knowledge/training in how to use these areas (33.3%), and lack of funds for creating outdoor classrooms, signage, materials, supplies, etc (30.7%). All other barriers were chosen by less than 14% of respondents.

Natural site educator responses indicated that there was a belief that barriers existed as no educator responded that there were “no barriers”. A majority of natural site educators believe the constraints are lack of funds (60%), lack of knowledge about the natural world (60%), lack of support (60%), lack of personal comfort/experience in leading students in these settings (60%), and a lack of personal experience in these types of settings (60%).

Almost 38% of formal educators responded that there were no personal limitations that prevented them from using EE. The most common responses of personal constraints were lack of time (24%), lack of pre-service, in-service, or professional development training (21.3%) and lack of personal experience in natural settings (16%). No formal educator felt a lack of connection to their own cultural background was a limitation. About 10% of formal educators were unsure.

No natural site educator responded in their beliefs that personal limitations did not exist with formal educators’ ability to utilize EE. A strong majority of natural site educators perceived that a lack of personal experience in natural settings (80%), and a lack of personal comfort in the natural world (86.7%) were personal barriers. A majority of these same educators felt that a lack of knowledge about the natural world (66.7%), a lack of knowledge about what environmental education is about (53.3%), a lack of

interest in being outside to teach (60%), and a lack of motivation to take kids outside (53.3%) were personal limitations. About 13% of natural site educators were unsure of personal barriers.

### **Research Question 3 Summary of Results**

In summary, a strong minority of formal educators perceive that barriers do not prevent them from using EE on or off site compared with a small percentage of natural site educators. A majority of responses by natural site educators, in terms of barriers for using EE on and off site and personal limitations, were significantly higher than those of formal educators. Only lack of connections to the curricula as a barrier for off site EE was seen as a constraint by more formal educators than natural site educators. Natural site educators were unsure of barriers at higher rates compared to formal educators on responses in reference to barriers to using EE at schools and personal limitations for using EE. Lack of support was not chosen by any formal educator as a barrier for going off site for EE. Barriers for formal educators typically increased in percentages for using EE on site compared with off site. Lastly, responses of “no barriers” decreased when exploring personal limitations of formal educators compared with logistical and administrative barriers.

**Table 4.8: Perceived Barriers for Visiting Natural Park Site**

<b>Barriers</b>	<b>Formal Educator Response Percentage</b>	<b>Natural Site Educator Response Percentage</b>
No barriers	42.7%	6.7%
Lack of school	16%	86.7%
Lack of student funds	17.3%	53.3%
Lack of time	14.7%	6.7%
Lack of connections to the curricula	13.3%	6.7%
Lack of support from teachers	1.3%	33.3%
Lack of support from administrators	0%	33.3%
Lack of knowledge related to opportunities as the site	13.3%	53.3%
Lack of positive student behavior	2.7%	26.7%
Lack of personal comfort level	6.7%	46.7%
Lack of personal experience in these types of settings	4%	40%
Lack of knowledge in answering questions about natural world in these settings	6.7%	6.7%
Lack of interest	2.7%	40%
Unsure	12%	6.7%

**Table 4.9: Perceived Barriers From Allowing EE at Schools**

<b>Barriers</b>	<b>Formal Educator Response Percentage</b>	<b>Natural Site Educator Response Percentage</b>
No barriers	42.7%	0%
Lack of funds	30.7%	60%
Lack of curricular resources	10.7%	33.3%
Lack of time	34.7%	40%
Lack of knowledge about the how to use	33.3%	60%
Lack of connections to the curricula	9.3%	40%
Lack of support	6.7%	60%
Lack of knowledge on the benefits	13.3%	60%
Lack of positive student behavior	9.3%	26.7%
Lack of personal comfort level in leading students in these settings	12%	60%
Lack of personal experience in these types of settings	17.3%	60%
Unsure	6.7%	20%

**Table 4.10: Perceived Personal Limitations From Using EE at Schools**

<b>Personal Barriers</b>	<b>Formal Educator Response Percentage</b>	<b>Natural Site Educator Response Percentage</b>
No barriers	37.3%	0%
Lack of personal experience in natural settings	16%	80%
Lack of knowledge about the natural world	9.3%	66.7%
Lack of knowledge about what EE is about	13.3%	53.3%
Lack of personal comfort in the natural world	9.3%	86.7%
Lack of pre-service, in-service, or professional development	21.3%	33.3%
Lack of interest in being outside to teach	4%	60%
Lack of motivation to take kids outside	1.3%	53.3%
Lack of time	24%	33.3%
Lack of connection to my own cultural background; cannot make connections for students	0%	40%
Unsure	10.7%	13.3%

#### **Research Question 4 Results: Perceptions of Policy, Race and Inequality**

The fourth research question asked: What are the perceptions of educators regarding educational policy, race, and inequality with using the outdoors to educate?

About half of formal educators (51.4%) and over 66% of natural site educators were unsure whether educational policy is a limiting factor for allowing EE. In terms of levels of agreement or disagreement, over 27% of formal educators and over 26% of natural site educators agreed compared to almost 21% of formal educators and almost 7% of natural site educators that disagreed.

The majority (53.5%) of formal educators were also unsure about whether race played a role in limiting EE at schools; however, those in agreement more than doubled (32.4%) those that disagreed (14.1%). Half of natural site educators (50%) agreed to

some degree with this statement while only 7.1% disagreed. Again, a high number were unsure (42.9%). No natural site educators strongly disagreed.

Lastly, a larger percentage of formal educators (47.9%) were unsure about whether inequalities exist between different demographical schools. There was a propensity to agree (40.8%) compared with those that had a tendency to disagree (11.3%). Natural site educators had similar results with 40% being unsure, while a majority (53.4%) agreed to some degree and 6.7% were in disagreement.

#### Research Question 4 Summary of Results

In terms of educational policy, race and inequalities within low income, majority African American student populated schools compared with mainly Caucasian schools, 40% or more of formal and natural site educators were unsure in all three instances as to whether these factors limited the ability to implement or use EE. However, within all three questions, there was a tendency to lean towards agreement to some degree that these factors did possibly exist as potential constraints.

**Table 4.11: Perceptions Educational Policy Constrains Schools From Allowing EE**

Degree of Agreement	Formal Educators' Frequency & Percentage		Natural Site Educators' Frequency & Percentage	
Strongly Disagree	3	4.2%	0	
Disagree	12	16.7%	1	6.7%
Unsure	37	51.4%	10	66.7%
Agree	16	22.2%	2	13.3%
Strongly Agree	4	5.6%	2	13.3%
Total	100%		100%	

**Table 4.12: Perceptions Inequality Exists Between Schools From Allowing EE**

Degree of Agreement	Formal Educators' Frequency & Percentage		Natural Site Educators' Frequency & Percentage	
Strongly Disagree	2	2.8%	0	
Disagree	6	8.5%	1	6.7%
Unsure	34	47.9%	6	40.0%
Agree	26	36.6%	4	26.7%
Strongly Agree	3	4.2%	4	26.7%
Total	100%		100%	

**Table 4.13: Perceptions Race May Play a Role in Allowing EE at Schools**

Degree of Agreement	Formal Educators'		Natural Site Educators'	
	Frequency & Percentage		Frequency & Percentage	
Strongly Disagree	3	4.2%	0	
Disagree	7	9.9%	1	7.1%
Unsure	38	53.5%	6	42.9%
Agree	21	29.6%	6	42.9%
Strongly Agree	2	2.8%	1	7.1%
Total	100%		100%	

**Overarching Theme Results: EE Support, Role of Educator, and Learning Theories**

Several questions were designed to explore the extent of educator support for EE and to possibly explore a combination of EE and multicultural education as a potential strategy to increase EE participation. Overall, over 69% of formal educators, indicated that they assumed there was some degree of support at their school for EE regardless of whether anybody was actively leading it. Only 28% of these same educators were unsure if their school supported EE at any degree and less than 3% felt their school did not support EE.

In terms of individual support, the majority (59.5%) of formal educators responded that they support EE and they are fine doing it while over 75% that responded indicated support for EE regardless of who was implementing it. In comparison, a large majority of natural site educators felt that schools should support EE and have multiple teachers doing this through cross curricular teaching (86.7%) and a majority (73.3%) felt schools should support EE by having informal educators come to the schools. No natural site educator felt schools should not support EE and no natural site educator was unsure in regards to this question.

A large majority of formal educators (82.2%) agreed to some degree that EE should be supported at their school, while over 93% of natural site educators felt that EE should be supported at these types of schools. Neither type of educator disagreed. A large



majority (89%) of formal educators queried also agreed to some degree that educators help in introducing the outdoors to students. No formal educator disagreed at any level that the role of the educator helps to introduce the outdoors to students. However, a smaller percentage of natural site educators felt the same – while a majority 60% agreed to some degree with this statement, 40% disagreed to some degree.

Almost half of formal educator respondents (43.8%) were unsure of their opinions to whether a lack of diversity in the outdoors is connected to a lack of diversity in STEM fields or other outdoor professions. Over 35% of formal educators leaned towards agreeing to some degree in their opinions compared with approximately 20% that disagreed. Similar to formal educators, slightly over half (53.3%) of natural site educators were unsure whether the issues were connected while about 33% leaned toward agreement versus roughly 13% that leaned in disagreement.

Regarding agreement towards whether educators were aware that the goals of multicultural education were similar to EE, a majority (62.5%) of educators were unsure of their thoughts to this question; though, there was a tendency to lean towards agreement (29.2%) which was over three times more than those that disagreed (8.4%). Secondly, a large majority of respondents (80.3%), regardless of whether they had training, stated they were aware of multicultural education. However, a majority (67.7%) were unsure or unaware of the concept of a combination of multicultural education and environmental education.

A large majority (86.2%) of formal educators responded they were not interested in their willingness to extend the project in contrast to a large majority of natural site educators (73.3%) that replied they were interested.

### **Overarching Theme: Summary of Results**

To summarize, a majority of formal educators believe their schools support EE, while both formal educators and natural site educators strongly support educators utilizing EE at school sites. Both types of educators were mainly unsure on whether the lack of diversity in the outdoors leads to a lack of diversity within STEM fields and other outdoor professions. For the most part, respondents felt the role of educators helps in introducing the outdoors to racial minority students with more support coming from formal educators than natural site educators. While a majority of formal educators were aware of multicultural education, a majority of these respondents were unsure that EE and multicultural education goals were similar and were unsure of the concept of multicultural environmental education.

**Table 4.14: Perceived EE Support & How Schools Should Support EE**

<b>Formal Educators' EE Support Category Perception of Their School</b>	<b>Formal Educators' Percentage</b>	<b>Natural Site Educators' Category Perception on How Schools Should Support EE</b>	<b>Natural Site Educators' Percentage</b>
Supports EE & Has a Teacher That Does This	24%	Schools Should Support EE & Have a Teacher That Does This	46.7%
		Schools Should Support EE & Have a Science Teacher That Does This	33.3%
		Schools Should Support EE & Have Multiple Science Teachers Doing This	46.7%
Supports EE & Has Multiple Teachers Doing This	18.7%	Schools Should Support EE & Have Multiple Teachers Doing This Cross-Curricular	86.7%
Supports EE But Nobody is Doing It	26.7%	Schools Should Support EE by Having Informal Educators Come to Their Schools	73.3%
Does Not Support EE	2.7%	Schools Should Not Support EE	0
Unsure	28%	Unsure	0

**Table 4.15: Personal Support & Action of EE On or Off-Site**

<b>Support Action Category of EE</b>	<b>Formal Educator Frequency &amp; Percentage</b>	
Yes, & I am fine doing EE	44	59.5%
Yes, if somebody else is doing it	12	16.2%
No	03	4.1%
Unsure	15	20.3%
Total	100%	

**Table 4.16: Perceptions of Lack of Diversity in Outdoors Connected to STEM Fields/Etc**

<b>Degree of Agreement</b>	<b>Formal Educators' Frequency &amp; Percentage</b>		<b>Natural Site Educators' Frequency &amp; Percentage</b>	
Strongly Disagree	4	5.5%	1	6.7%
Disagree	11	15.1%	1	6.7%
Unsure	32	43.8%	8	53.3%
Agree	20	27.4%	2	13.3%
Strongly Agree	6	8.2%	3	20.0%
Total	100%		100%	

**Table 4.17: Educators' Level of Agreement In Supporting EE at School**

<b>Educator Degree of Agreement in Supporting EE at Schools</b>	<b>Formal Educators' Frequency &amp; Percentage</b>	<b>Natural Site Educators' Frequency &amp; Percentage</b>
Strongly Disagree	0	0
Disagree	0	0
Unsure	13 17.8%	1 6.7%
Agree	42 57.5%	2 13.3%
Strongly Agree	18 24.7%	12 80.0%
Total	100%	100%

**Table 4.18: Agreement of Educator Roles Helps Introduce the Outdoors to Students**

<b>Degree of Agreement</b>	<b>Formal Educators' Frequency &amp; Percentage</b>	<b>Natural Site Educators' Frequency &amp; Percentage</b>
Strongly Disagree	0	1 6.7%
Disagree	0	5 33.3%
Unsure	8 11%	0
Agree	46 63%	5 33.3%
Strongly Agree	19 26%	4 26.7%
Total	100%	100%

**Table 4.19: Agreement of Goals of Multicultural Education Similar to EE**

<b>Degree of Agreement</b>	<b>Formal Educators' Frequency &amp; Percentage</b>
Strongly Disagree	2 2.8%
Disagree	4 5.6%
Unsure	45 62.5%
Agree	19 26.4%
Strongly Agree	2 2.8%
Total	100%

**Table 4.20: Awareness of Multicultural and Multicultural Environmental Education**

<b>Degree of Awareness for ME</b>	<b>Formal Educators' Frequency &amp; Percentage</b>
Yes, Aware & Have Training	24 33.8%
Yes, Aware But No Training	33 46.5%
Not Aware of ME	9 12.7%
Unsure	4 5.6%
Total	100%
<b>Degree of Awareness for MEE</b>	
Yes, Aware	23 32.4%
Not Aware	30 42.3%
Unsure	18 25.4%
Total	100%

**Table 4.21: Willingness to Further Participate in the Project**

<b>Willingness to Further Participate</b>	<b>Formal Educators' Frequency &amp; Percentage</b>		<b>Natural Site Educators' Frequency &amp; Percentage</b>	
Yes	9	13.8%	11	73.3%
No	56	86.2%	4	26.7%
Total	65	100%	15	100%

### **Response Comparisons Based on Educator Age and Ethnicity**

In this section, to further analyze results descriptively, the Chi-square formula was calculated via SPSS software to determine whether there is an association between variables. A 0.05 level of significance was utilized meaning that any p-values greater than the level of significance would be determined as the two variables are not significant, in better terms, there is not a relationship and they are independent. The applied rule would then be a failure to reject the null hypothesis – the variables are not associated. However, if the p-value is less than a 0.05 level of significance the alternative hypothesis is that the variables are associated, meaning there is a relationship in the two variables that are in this case dependent.

While the majority of survey questions, when cross-tabulated using the Chi-Square formula, resulted in a measurement above the threshold of a 0.05 level of significance, meaning the variables were not associated or more data was needed, there were three questions that showed potential associations. Ethnicity may play a role in the responses from formal educator questions regarding whether there was a perception of a lack of diversity within STEM fields and other outdoor natural setting professions (question #6) and whether they felt EE should be supported at their school (question #22). Age was also a potential factor in the response from formal educators in regards to being questioned about the extent in which they agree that educational policy constrains

schools with low income, minority student populations from allowing EE (question #24).

The following table summarizes the Chi-Square tabulated level of significance for all formal educator survey questions that were measured with identifying whether ethnicity or age factored into their response decisions.

**Table 4.22: Chi-Square Calculations for Association Between Variables**

<b>Formal Educator Questions Regarding Perceptions, Agreement/Disagreement</b>	<b>Chi-Square Calculation Level of Significance Ethnicity</b>	<b>Chi-Square Calculation Level of Significance Age</b>
<b>Lack of diversity in outdoor recreation (Q5)</b>	.217	0.659
<b>Lack of diversity in STEM fields (Q6)</b>	.010 variables may be associated	0.960
<b>Lack of diversity in outdoor rec connected to lack of diversity in STEM (Q21)</b>	0.164	0.129
<b>EE should be supported at their school (Q22)</b>	0.036 variables may be associated	0.535
<b>Role of educator helps introduce outdoors to students (Q23)</b>	0.551	0.197
<b>Educational policy constrains schools from allowing EE (Q24)</b>	0.556	0.040 variables may be associated
<b>Inequality between schools in allowing EE (Q25)</b>	0.568	0.460
<b>Race may play a role in inequality in allowing EE (Q26)</b>	0.424	0.416
<b>Goals of multicultural education similar to EE (Q27)</b>	0.387	0.610

### **Educators' Response Patterns to Open-Ended Questions**

In this section, open-ended question responses were transcribed, filtered and coded for patterns – see Chapter 3. Handwriting was difficult to decipher in many responses. Some responses were very generic and some were very specific. However a

few patterns emerged. The first, and most salient were in terms of memorable outdoor experiences formal educators had as children and activities they participated in now.

Responses were coded into six different sets: Organized Camps, Family Activities, Managed Area/Walking Activities, Outdoor Adventure Activities (such as hiking, kayaking), Hunting/Fishing, and Organized Sports (tennis for example). Camping was assumed to be car/RV camping based on the assumption that wilderness camping would have been conveyed as backpacking. Patterns appear to demonstrate that Caucasian educators participated in more outdoor adventure activities and paid organized camps as children; African Americans remembered more family and church activities including cookouts and picnics. Caucasian trends also showed that educators remember going away with the family to destinations. As adults, these same patterns continued. Caucasians spend more time participating in outdoor adventure sports – specifically hiking and camping, but the numbers were not overwhelming. African Americans tended to lean more toward group settings such as picnics, concerts, and festivals. Many Caucasian mentioned running, including trail running. Both ethnicities indicated walking as a current favorite.

In reference to Likert type questions, formal and natural site educators responded with similar themes on several questions. These themes included the belief that part of the educators' role and job is to introduce new experiences to students; especially if students do not have these opportunities at home. Restating the multiple benefits of EE was another easily identified written response. Other themes relate to commonly stated themes in prior research: time, funding, and teaching connected to standardized testing were identified.

**Table 4.23: Formal Educator Themes to Open-Ended Questions**

<b>Educator Survey Question Topic</b>	<b>Formal Educator Identified Theme</b>	<b>Natural Site Educator Identified Theme</b>
<b>Diversity issues in outdoor recreation connected to diversity issues in STEM fields/etc</b>	Need for a role model/educators provide the opportunities and introductions	Need for encouraging and increasing exposure for kids to be outside
<b>Personal support for EE at school</b>	Benefits of EE	Benefits of EE & all kids should be exposed to nature
<b>Educators' role helps to introduce outdoors</b>	Educators' role/job is to introduce new experiences	Part of the job to introduce things that cannot be done at home
<b>Policy constrains EE</b>	Funding (available and unavailable) & Time	Mandated to follow standards to "teach to the test"
<b>Inequality constrains EE</b>	Funding disparities – Caucasian schools allocated more funds; parents have more money = more flexibility	Funding disparities
<b>Race constrains EE</b>	No salient theme	No salient theme
<b>Goals of multicultural education similar to EE</b>	No salient theme	Not queried

### **Natural Site Educators' Patterns From Focus Groups**

As there were only nine total natural site educators able to participate in three focus groups, the responses were grouped together in an attempt to find patterns and salient themes. Only a few definitive patterns were identified within the groups. These were identified by placing all comments into categories based on similarities. The first theme is that educators at all three sites stated that the issue is being discussed within their agency and agency staff have been aware of the trends for some time. A time period of awareness was not acknowledged. Secondly, funding and available time and manpower to implement strategies is always a concern. Third, strategies are being brainstormed and plans are being developed in reference to future goals.



## **CHAPTER FIVE**

### **DISCUSSION AND CONCLUSIONS, LIMITATIONS, RECOMMENDATIONS**

During March and April of 2014, formal educators at three Richland County, South Carolina elementary schools were surveyed in regards to the issue of under-participation by minorities, specifically African Americans, within the outdoors and how this connects to the same inequality within STEM fields and other outdoor professions. The formal educators were compared with those of natural site educators at three “wildland” natural sites within close proximity to the schools. The project was guided by one overarching area of interest in exploring whether the role of the educator should be considered within the research that connects to theoretical reasons within Critical Race Theory of why minorities, specifically African Americans, are disconnected from the outdoors. Four major research questions were designed around this theme:

1. Do formal educators (classroom teachers) and informal educators (educators at the natural sites) differ in their levels of awareness of low racial minority participation in outdoor learning settings and STEM fields and the factors that affect their participation?
2. How are formal and informal educators (educators at the natural sites) connecting with each other? Are informal educators reaching out to local schools and/or are formal educators aware of the sites and opportunities at those sites?
3. What barriers (logistical - time, money, institutional - curricular, administrative support, and EE goal barriers - dispositions/knowledge/personal experience/comfort level

of educators) are formal and informal educators facing that prevent them from using the outdoors?

4. What are the perceptions of educators regarding educational policy, race/ethnicity and multicultural education in connection with using the outdoors to educate?

Data collection took place over the course of approximately six weeks during March and April 2014 utilizing a survey that included quantitative and qualitative questions. Survey responses were analyzed using SPSS software that resulted in descriptive statistics through frequency distribution tables along with calculating correlation of variables via the Chi-square formula to determine whether variables were dependent or independent of each other. Fifteen natural site educators representing three natural sites, [(Congaree National Park (7), Sesquicentennial State Park (5) and Harbison State Forest (3)] participated along with 75 (66%) formal educators representing a total population of 113 educators from three nearby low-income, largely African American populated elementary schools. Three focus groups sessions also took place with participants from the natural sites.

In terms of demographics, all natural site educators were Caucasian along with 61.6% of the formal educators, while 37% were African American teachers. The majority of formal educators (63.5%) and the natural site educators (86.7%) were under the age of 40. These same age groups represented the majority in terms of least amount of experience: 58.1% of formal educators and 86.7% of natural site educators had less than 11 years of experience in their field. Generally speaking, taking the demographics into consideration, the project produced some interesting points of contention in regards to exploration of the underlying issue.

### **Research Question 1 Discussion: Perceptions of Racial Minority Participation**

Regarding the first major research question, formal and natural site educators differed significantly with their perceptions in reference to the issues examined. Natural site educators' perceptions were double that of formal educators in regards to the first issue of perceiving that a lack of diversity within outdoor recreation exists. Several assumptions can be made for possible causality related to the findings reported from the surveys.

The first rationale is attributed simply to the notion that natural site educators, based on focal group discussions, are already aware of the issue and have begun strategizing solutions to a phenomenon that they witness on a daily basis. This theme was repeated with each focus group. The next two assumptions, however, are connected to formal educators. The first proposition is that formal educators' perceptions are low simply due to not being aware of the issue themselves, possibly from a lack of knowledge. The rationale here is that the majority of formal educators are under 40 with 10 or less years of experience. The logical connection with this demographic is these educators are using pedagogies highly dictated by technology that contributes to a sedentary, indoor lifestyle. These educators represent a generation that was schooled during the rise of the Technology Age during the 1990s; thus, the outdoors are seen as secondary to technical skills that teachers are having students focus on. Responses to open-ended questions in reference to current outdoor recreation patterns by these adults allude to a preponderance of activities that are removed, for the most part, from natural sites that offer outdoor recreation activities.

However, to counter this explanation, is the ideal that the researched issue is simply not occurring at these schools or this particular school district. Survey responses related to support and barriers along with discussions with natural site educators suggested that formal educators from this district are a little less constrained in their ability to incorporate EE into their methods. To further validate this point, age demographics again need to be referenced. Due to the age descriptives, the majority of formal educators are thought to also have been exposed to the “green” and sustainable lessons that have increasingly occurred since the mid 1990s in which the majority of these educators were most likely finishing high school and attending college. Assumingly, these lessons are a part of their own teaching pedagogies coupled with the fact that two of the schools have program initiatives posted on their websites that include lessons connected with the goals of EE.

While natural site educators’ responses were still significantly higher than formal educators in regards to perceptions of a lack of diversity within STEM fields and other outdoor professions, the difference was less than the first issue discussed. An interesting point with this second issue is that uncertainty increased with both educator surveys suggesting that knowledge about this issue is less and individuals are not able to directly observe this phenomenon in either field beyond their own professions; natural site educators did acknowledge a lack of diversity within their chosen profession.

Another point of contention with formal educators’ perceptions increasing with this issue is the concept that race may have played a small role in formal educator responses based on the Chi-square cross tabulation. Demographics indicated a majority of African American educators were older than their Caucasian counterparts, lending to

the possibility that African Americans are aware of this issue within their own culture.

Perceptions about barriers that limit outdoor recreation participation by diverse cultures also differed significantly with natural site educators having higher percentages on a majority of possible causes. The main explanation attributed to this again refers to natural site educators observing visitation patterns from a large spectrum of the population and interactions allow them to make assumptions versus the formal educators speculating on what they do not observe on a daily basis. A secondary explanation is personal outdoor recreation patterns. While natural site educators were not queried, it is assumed that their recreation patterns are such that exposure to natural site activities is at much higher rates than the patterns of formal educators that were recorded and analyzed.

### **Research Question 2 Discussion: Communication and Logistical Awareness**

Concerning the second major research question, formal and natural site (informal) educators appear to be connecting with each other based on the following results that were reported from educators in this district: A majority of formal educators (89.3%) are aware of the nearby natural site to their school; over 87% of formal educators are aware to some degree of the educational opportunities and/or fees at the sites; all resources at the nearby parks are being used for multiple purposes with using park educators for science leading the way; and all of the nearby park physical opportunities are being used as resources with picnics within a natural setting leading the choices. It is not known how often specific schools utilize their sites either from multiple grade visitations in a single year or the same grade level returning annually.

In terms of educators being contacted either directly or indirectly, natural site educators are connecting with formal educators. Over 38% of formal educators have

been contacted or the information passed on to them from school administrators. Using a frequency of 28 individuals representing the 38% of educators that responded and correlating this to the entire population of 113 possible teachers at the three schools, this equates to about 25% or 1 in every 4 educators receiving the information. When factoring in that there are six grade level teams at each school with an average of 6.36 teachers per team at the three schools, 25% represents a strong minority. This means that there is a high likelihood that at least one person per team received the park information and theoretically conveyed it to their grade level team during meetings. This can also be explained as the natural site educator contact specifically aiming to convey information directly to either an administrator or a lead/science teacher.

Almost half of natural site educators (46.7%) responded that they had made personal visits to nearby schools. While last contact may have ranged from as recently as six months to a maximum of four years by individual natural site personnel, contact is attempted at a minimum, every couple of months to about once a year by at least one employee. Considering constrained budgets, reduced staffing, and natural site educators' responsibilities go beyond education and include many different roles, this appears to be quite frequent taking into account the 25% of formal educators that have received the information. This also demonstrates natural site educators are being utilized as a resource beyond their sites. Natural site educators have observed their resources and opportunities being utilized to some extent by a wide range of schools with varying demographics confirming that schools in general are using these places as EE resources for field trips and the initial communication between entities is possibly assisting educators.

The results are important in that pattern usage at natural sites demonstrate that these locations are serving as a possible bridge to connect schools to the learning theory of EE in which visiting schools may or may not be able to address adequately at their own school sites. Secondly, these sites are potentially being used to enhance the approaches of the formal educators.

### **Research Question 3 Discussion: Barriers to Using Outdoor EE Settings**

With reference to the third major research question, formal educators differ significantly in their perceptions of barriers to using EE compared with natural site educators. Formal educators responses indicated a perception of fewer barriers while natural site educators believe barriers still constrain educators to a higher degree. This possibly indicates either natural site educators are more knowledgeable about what previous research has shown and hold viewpoints based on direct observation or, from the viewpoint of formal educators, barriers are less of a constraint in this district.

Almost half of formal educators (42.7%) stated that barriers do not prevent them from visiting the nearby park, despite their school being labeled as low income with a majority student population of African Americans. This contradicts the perceived notion that these schools are constrained due to a lack of funds to visit sites. This then potentially supports the earlier statement that this district may have better opportunities. Another interesting point is that no educator felt that lack of support from administrators prevented their school from visiting nearby parks; however this could be explained that educators were hesitant about responding to this question for fear of reprisal from administrators.

All barriers available on surveys showed low percentages (less than 20%) by formal educators as constraints in going off site to natural areas for EE. However, a majority of natural site educators felt funding and knowledge about the site were constraints, but these educators were basing their responses on all observed schools that visited versus the examined three schools. What is plausible from these results is that district and school demographics along with educator awareness of sites may play a role in off-site EE opportunity.

In terms of possible barriers for place-based EE at the schools, formal educators again responded lower than natural site educators on their perceptions that limit EE. The two exceptions were that lack of time and lack of funds both doubled for formal educators compared with going off-site. This may be explained as only one grade level educator utilizing EE at schools versus all grade level educators going off-site. Lack of knowledge/training in how to use, which was not an option for barriers to off-site EE, had a strong minority of over 33% of formal educators responding as a constraint alluding to the notion that formal educators may feel more comfortable with other resources leading EE; however, it could be argued that this response was based on subject specialization. Most natural site educators responses were double or more those of formal educators for most responses inferring that there is a belief by natural site educators that the barriers that the research often references still exist. Again, it must be noted that natural site educators are responding based on all schools they observe and district and school demographics along with educator awareness of sites may play a role in off-site EE opportunity.



A very interesting finding was that over a third (37.3%) of formal educators responded they did not have personal limitations from using EE as a method. In fact, all possible limitations were seen as barriers by only a quarter of all participants. Countering these findings, natural site educators again perceived at higher rates the limitations; in this case all personal barriers had significantly higher perceptions that constrained formal educators from utilizing EE. A strong majority of natural site educators (80%) felt personal experience and personal comfort would be limitations (86.7%).

What the discrepancies demonstrate are a couple of points of contention. One, barriers for formal educators increase when faced with moving from off-site EE that has established resources to place-based EE at the schools in which the mission now includes sustaining the program versus simply teaching EE or using other sites and personnel as resources. Secondly, there are disparities in perceptions in the barriers that limit formal educators from utilizing EE, specifically in terms of personal limitations. This leads to a possible issue with the amount of confidence that natural site educators have in formal educators in regards to their ability to lead EE. What must be mentioned is that natural site educators are basing their analysis on all educators that they observe; therefore, this trend does not necessarily connect with educators from the explored district. Lastly, based on open-ended responses, the benefits of EE may hold such high value for formal educators that they attempt to overcome the barriers and administrators may be highly supportive and encourage the use of EE due to the benefits.

#### **Research Question 4 Discussion: Perceptions of Policy, Race, and Inequality**

In relation to the fourth major research question, formal and natural site educators were unsure in their perceptions on whether policy, race or inequality played a role in

allowing EE at schools with low income and a majority student population of people of color compared to mainly Caucasian schools. However, there were patterns demonstrating a tendency to agree to some degree versus disagreement in regards to the above three variables. It was noted by natural site educators that schools that frequent the parks the most are perceived to be schools with mainly Caucasian students and educators.

A logical rationale for these uncertainties with both sets of educators is simply explained that the educators, due to the high percentage of them having less than eleven years of employment and being under 40 simply may not have enough education, experience and/or combined level of awareness and knowledge in terms of how educational theory, policy, and practice play a role in educational administration. Secondly, educators may have been reticent to respond about these issues for fear of retaliation based on the notion that survey results were available for the district, school administrators, and educators upon completion of the project.

While the levels of uncertainty do not definitively suggest issues with critical race, the patterns of agreement with these results potentially demonstrate the need for future exploration in how critical race theory may be embedded within educational institutions regarding EE. While there were many uncertainties leading to a lack of concrete knowledge and awareness in the areas of policy, race, and inequality; the patterns did show, to some degree, a level of agreement that these three issues may play a role in school decisions. These decisions being referenced as what schools are allocated the resources, opportunity, and support for the allowance of EE construction and sustainability on school sites along with visitation patterns aimed specifically at natural sites for EE.

### **Overarching Theme Discussion: Support of EE, Role of Educator, and Learning Theories**

This research project was guided by one main theme, the role of the educator in introducing the outdoors to students by using EE. While formal and natural site educators were unsure in their perceptions on whether the issue of a lack of minorities in outdoor natural settings was connected to a lack of minorities with STEM fields, there was support for EE and toward the role of the educator in introducing the outdoors to students by both sets of educators.

Survey results indicated EE is supported by a majority of all the educators indicating that educators are probably aware of the benefits that this learning theory has demonstrated. First, over 69% of formal educators assumed their school supported EE in general or had a teacher or multiple teachers leading it. A strong majority (74%) of formal educators supported EE using on or off-site natural area learning sites. More definitive statistics related to personal opinions for their school is the strength in that about 72% of formal educators felt EE should be supported at their school with no disagreements. This is extremely important as it transcends beyond assuming that the school supports EE to implying that the individuals that make up the identity of the school supports this learning theory. Stronger yet, is the fact that 89% of respondents from schools believe the role of the educator helps in introducing the outdoors to students which is critical in the sense that these schools were low income with a majority African American student population.

Natural site educators added to this interesting dynamic in supporting all ways in which schools should support EE including a large majority (86.7%) stating multiple teachers should do this through cross curricular. Over 93% of these same educators

responded that EE should be supported at low income, racial minority populated schools. While only 60% agreed that the role of the educator helps in introducing the outdoors to students, this connects to the notion that 73.3% of natural site educators felt EE should be supported at schools by having informal educators come to the schools. The connection is based on the assumption that natural site educators may have a lack of confidence in the ability of formal educators in leading students in place-based EE settings at the schools. These findings relate back to barriers as natural site educators assumed at higher levels that formal educators are constrained with their ability to implement EE, therefore, natural site educators are supportive in a sense that their role is critical to supporting formal educators implementation of EE.

A majority of formal educators indicated they were aware of multicultural education and many had training. However, despite showing strong support for EE, the majority of educators were unsure of whether the goals of EE were similar to multicultural education and a majority were unaware about the concept of multicultural environmental education. This can easily be explained first by the fact that many educators still view EE as science education and that data was not collected to identify whether educators had EE training. Secondly, multicultural environmental education is still a fairly unknown concept that has not received much attention since its theoretical founding in the last decade of the 20<sup>th</sup> century. What is questionable is that despite support for EE and knowledge of multicultural education, a gap in the utilization of EE still exists even with few limitations from formal educators being stated.

## **Discussion Summary**

In brief, the above findings from the project indicate several key points. Natural site educators and formal educators from this specific demographic district differ significantly on whether there are diversity issues within the outdoors and STEM fields. While schools and natural site educators are connecting with each other through communication and visitation patterns, barriers to using EE still exist. However, the educators differ in their perceptions on the constraints in that natural site educators perceived at higher rates the barriers that limit EE compared with formal educators. Barriers to EE increase when formal educators are tasked with implementing and utilizing EE at their school sites compared with at natural sites. Both sets of educators differ in their opinions of personal limitations that constrain educators from utilizing EE with natural site educators responding at higher frequencies that personal limitations constrain educators.

While support for EE is high, most of these educators are unsure whether a lack of diversity in the outdoors leads to a lack of diversity within STEM and other outdoor professions. Both sets of educators are also relatively unsure on whether race, policy, or inequality issues affect the implementation of EE. Most educators agree that the role of the educators assists with introducing the outdoors to students. While many educators support EE, most are unaware that EE and multicultural education have the same goals and most of the concept of multicultural environmental education.

## **Project Limitations and Proposed Changes**

While some interesting and potentially valid information arose from the results of this project, there were some limitations that need addressing as this area of research

continues to be expanded upon. There is an immense amount of data contained within this project; however, determining definitively whether the results are completely uninhibited is difficult to project. For starters, the entire proposal had to be modified due to circumstances out of the control of the researcher. One district was completely closed to research and one identified school within the approved district was also closed for research. New schools were identified that contained only a majority African American student population versus a large majority of over 75% that was also low income. For future research to connect with this project, it is proposed that schools within other districts that include a higher percentage of low income African American students are examined and compared. It is also imperative to contrast districts based on location such as urban, sub-urban, and rural along with varying racial, ethnical, and socio-economic demographics.

While the schools that did participate were extremely helpful, timing was also an issue. Moving forward, future research will hopefully not be constrained by this issue and the original proposal variable will be accommodated. Ideally, the researcher really needs to be present at a faculty meeting to fully explain and answer questions regarding the project along with the ability to insure participants are fully aware of the defined terms and value in the research. This includes specifically defining EE, as there was an assumption that educators responded to the survey with the view that EE is mainly science education.

After reviewing the administered survey, some changes to the instrument would also be suggested as there is a sense that it was a little too extensive and somewhat intensive. There is the possibility that there are multiple research projects embedded

within the survey. A shorter survey would allow for several response changes such as more thought-out responses to each question along with the possibility of increased and richer descriptive information within the qualitative section. Due to the excessive length, many respondents left open-ended answers blank, appeared to have a tendency to rush through answers making them difficult to interpret and code, and hand writing was sporadically indecipherable. Without the constraint of time, as some respondents stressed this was the reason why they would not like to proceed further with the project, the likelihood that there would be more interest in participating in a focus group would increase. Collecting data on whether educators have EE training would also be included in the revised survey design as this was not collected and is important in the area of determining whether educators fully understand the learning theory and that they may already have some training based on their knowledge of multicultural education.

The validity of the data and the reliability of the study would also be addressed in multiple ways beyond a pilot survey along with insuring confidentiality with educators. There was a sense that educators were possibly reluctant to accurately respond to several questions. This is where the need for formal educator focus groups and interviews needs to occur in order to gather unbiased data.

For the purpose of triangulation in order to include a demographic glimpse into who is taking advantage of grant opportunities to construct place based outdoor learning sites, several grantors at local agencies that provide funding would be queried. Triangulation would be proposed and possibly achieved by the multiple data sources collected from the grant administrators via structured interviews, the focus groups sessions with the formal and natural site educators, and the collected survey data.

Observations at the outdoor sites are proposed, but will be utilized only in the event more data is deemed necessary and data saturation has not been achieved through the previously proposed data collection methods. A long term proposal for this study would include at least four to eight site visits to each location during each of the prime outdoor seasons in mid spring and mid fall. The rationale for adding this component will be to verify queried statements given on pattern usage by natural site educators along with comparing and contrasting demographics for each site. Collecting records of visitation patterns from the natural sites would also be included.

Ideally, structured interviews would be employed with the caveat that some minimal free flow form will be allowed to avoid the possibility of being too rigid. With a little free flow, the potential for more in-depth discovery of the main questions might be gained. As this is a complicated issue of a somewhat critical and sensitive state, the structured interview is deemed the most appropriate despite being time consuming. Depending on how variant the data is from each informal educator, it would be plausible to bring educators together after the main study for additional information via a focus group as a means for all to have a chance to hear results and brainstorm new avenues and strategies.

### **Recommendations**

Based on the results obtained from this research project, suggestions are being recommended as a means to increase the role educators in introducing more marginalized students to the outdoors through a combination of using EE at their sites, utilizing EE resources, and new teaching strategies. The suggestions have been designed from the analyzed surveys, responses to open-ended questions and the focus group discussions.



### **Research Question 1 Recommendations: Racial Minority Outdoor Participation**

First, the information regarding the issues of under-participation by minorities within the outdoors and STEM fields must be conveyed to educators as the level of uncertainty and not believing the issue exists was viewed by a combined majority of respondents compared with perception that the issues exist. Educators that focus on STEM subjects must be reminded why it is they are mandated to teach these areas so that the “how” and “why” do not simply get lost in an acronym. Thus, redefining the goals of STEM education should continuously occur and is suggested to include the issues at hand along with teaching strategies that extend beyond the classroom that include technology in the field. This also includes having the information about the issues readily available for others on school websites, specifically if the school promotes student-led initiatives that incorporate the goals of EE and multicultural education. Publications and reports that publicize the critical nature of the issue must also reach the hands of educators charged with the crucial task of molding the minds of minority students.

Secondly, educators that lead EE initiatives also must understand the connections that their programs, that are geared toward service learning, student collaboration and critical thinking and problem solving have on this issue so that these initiatives are not just seen as novelties to make the school look “green”.

In terms of the barriers, formal educators must strategize and implement initiatives that increase participation as a whole, especially if the school is deemed as the safe haven for students. Allowing time for simple, structured free play is critical for childhood development and is especially important for those marginalized students that live in areas in which these opportunities do not exist or are unsafe. This is based on the

notion that one of the many opportunities most frequently observed by natural site educators at their sites was the use of the park for picnics with students. Simple structured free play has merit in itself as it allows for self discovery, exploration, and inquiry.

Natural site educators, based on focus groups, will need to continue implementing their strategies of the future and should convey their projects to local schools and communities. For example, one natural site has constructed a new trail that is located in an area frequented by diverse populations, including African Americans. The trail was designed to make those not accustomed to the outdoors feel a little more comfortable in nature and was designed based on visitation patterns of diverse populations. Design included an aggregate surface separating it from the natural terrain and the nature surrounding the trail is a little more “open” or maintained. Schools can implement these same strategies with the construction of outdoor classrooms that are “open” and located within a managed landscape that is around a natural setting. There are resources that are exploring the issues at hand and can assist in the design and construction. Other suggestions include natural sites developing specific events aimed toward racial minorities such as events celebrating diverse cultures and events aimed at re-introducing the outdoors and nature to adults to help develop skills and comfort levels.

### **Research Question 2 Recommendations: Communication and Logistical Awareness**

While natural site educators are aware of the issue and are doing a good job themselves with contacting schools, they must continue this strategy. Natural site educators must realize their continued outreach and networking is crucial for EE in order to increase participation as these educators are typically deemed the expert resources.

Continuing to create areas within natural sites that are a little less wild and more managed is again suggested as a means to open up the areas for all populations to have comfort for structured free-play nature time if picnics are the only way that specific schools utilize their sites. Due to the prediction that people of color are expected to represent the majority of the student population in the near future, addressing the visitation pattern needs of diverse populations in order to increase comfort levels and participation is recommended to continue and example strategies at these sites already exist. Natural sites at different entities need to work together – this not only includes collaborating on strategic measures for the future but utilizing, connecting, and promoting one another to schools as the missions in terms of education at these sites are very similar in nature. If funding to visit these sites does constrain the formal educators, then a collaborative effort by natural sites to make schools aware of opportunities close to each school can potentially help to address the issues.

Incorporating technology that allows for “green” initiatives and longitudinal studies as well as capturing the technology generation while decreasing the digital gap is also suggested. QR codes was one suggestion that was repeated with focus groups. Another suggestion for natural sites is to increase the educational messages of the historic role of diverse cultures within their park or in natural and environmental sciences. This would allow for multicultural connections to the curricula along with the celebration of diversity during specific heritage months. Several of these suggestions have already been included in the strategic plans of the natural sites included in this study for the future.

Cross curricular opportunities must also be increased. This includes networking, partnerships and collaboration between educational entities such as schools, museums,

botanical gardens, zoos, and natural sites. For example, one site previously had a partnership with a local art museum which allowed for school groups to come to the natural site and combine art with science. Another site local example is one natural site had an existing partnership with an educator at a school in which a long term research project was being conducted at both sites. These types of collaboration are more appealing to a wider range of audiences and would also allow for greater support of EE in that educators would observe to a greater degree the ability of EE to include subjects beyond just science is possible.

### **Research Question 3 Recommendations: Barriers to Using Outdoor EE Settings**

In terms of research involving barriers, whether the length of the survey limited responses remains hidden; however, if the responses are truly a reflection of the sample population, then there are two suggestions to be made. First, future researchers may want to revisit this area to confirm in other geographical areas whether the barriers that are so often stated as limiting factors for educators are still the predominant limitations to the issues. Results from this project indicated that formal educators and natural site educators differ significantly on what constrains schools from allowing EE. Thus comparing rural to suburban and urban schools that have majority low income African American student populations is needed as there may be a variance in perceptions.

New research on new barriers added to the existing list is highly suggested. If EE is so highly supported by educators in this survey, then what factors are still limiting educators from utilizing EE is still in question. Several new barriers have been conceptualized and these include: dress code issues and the inability to be comfortably dressed for the outdoors and to work and “get dirty” with the students; the health of the

educator in their ability to withstand the elements during the duration of multiple schedule blocks; the health of students and the fear of allergic reactions; the issue of the increased emphasis on technology including how to use technology outside; the lack of being able to simply go outside for stress relief, restorative mental relief and structured free play that simply exposes students and their senses to the outdoors; the issues with “teach to the test”; and the sedentary lifestyle that many teachers simply have. While this list is by no means exclusive, it does offer the potential for consideration as this issue increases as racial minorities are expected to be the majority of students in the not so distant future.

At the same time, natural site educators may want to instill a little more confidence within their perceptions of the abilities of formal educators. The rationale being that educators from this district and those that may have more opportunities for EE may have increased experience, comfort levels, knowledge, and the existence of sustainable EE programs. With the growing trend in sustainable issues, a pool of teachers that have fundamental knowledge in hands-on skills such as gardening is also theoretically increasing and needs to be capitalized upon. Lastly, if funding and time are still constraints for educators, then educators need to be connected to schools that have successfully implemented initiatives on constrained budgets in order to learn how to overcome the limitations. Beyond available funding resources, educators need to be introduced to the many ways that EE initiatives can be durably constructed with tangible objects that are readily available and free.

#### **Research Question 4 Recommendations: Perceptions of Policy, Race and Inequality**

While the majority of educators are uncertain of whether policy, race, and inequality impede the implementation of EE in low income schools with a majority student population that are people of color, there was a tendency to agree that these issues exist. Critical race theory within EE is an imperative theme that must be examined more in schools as the academic achievement level of critical skills that students need for the 21<sup>st</sup> century continue to have an achievement gap between Caucasians and marginalized students. While results from this project did not have overwhelmingly definitive statistics that these factors play a role in educational practice, the patterns of agreement do suggest that this is a worthy consideration for future research to explore. Focus groups and open-ended questions suggested a theme that educators are aware of the academic benefits and other benefits of EE. It is suggested that the information pertaining to the issue coupled with the benefits is made available to policy makers and administrators through multiple avenues. Administrators often focus on statistics and if concrete numbers can be demonstrated on how EE increases achievement as well as saving the school money, then there exists the possibility that EE can be infused with greater resources since the support from educators is, theoretically, already in existence.

#### **Overarching Theme Recommendations: Support of EE, Role of Educator, and Learning Theories**

Whether through pre-service or in-service workshops, educators must understand that EE is not just nature studies. Despite having EE defined at the beginning of the survey instrument for this project, there is a sense that educators still responded with EE viewed as science education, possibly evident by the notion that EE was supported and a

majority of educators were aware of multicultural education but unaware that the two learning theories have similar goals. The educators in this project have conveyed that they understand the benefits of EE and support using EE, including having EE at their schools, and that the role of the educator does assist in assuaging the problem. Natural site educators also conveyed in focus groups themes that the educator is tasked with introducing new experiences to students as part of their job. With these ideals, it is recommended that educators are continuously reminded of EE workshops, specifically those that are local and for the most part, are often still free or at reduced costs. This includes Project Learning Tree, which at the time of this writing was free in South Carolina. While the participants in this project responded that the role of the educator does help in introducing the outdoors to marginalized students, more research in this area is needed, specifically from a wider demographic arena in order to definitively state whether educators contribute to the causality of a lack of diversity in the outdoors. The term “help” is somewhat vague and it is recommended that research examines the amount of time spent in the outdoors along with specific demographics of educators themselves including location.

A possible recommendation that may allow for increased comfort levels with implementing EE and an increased number of teachers beyond science educators that utilize EE, is the suggestion that the learning theory of multicultural environmental education is encouraged and promoted. If STEM skills are increasingly continued to be infused into school lessons, specifically at low income schools with large diverse populations coupled with the notion that a majority of educators support EE and have multicultural awareness, then it seems logical to blend the two. The rationale is that the

term EE often invokes images of science education while multicultural environmental education can be depicted in such a manner designed as a learning theory for all students in all places and time.

### **Conclusion**

Several statements can be concluded from the analyzed results of this project. First, formal educators differ in their perceptions of the issue of diversity and the barriers that constrain racial minorities from participating in the outdoors and associated professions compared to natural site educators. Secondly, schools appear to be connecting with natural sites and utilizing resources for EE and nature time; however, formal educators differ in their perceptions about barriers that limit the utilization of EE compared with natural site educators. Third, while formal and natural site educators are, for the most part, unsure whether policy, race and inequality affects schools from allowing EE, there is a tendency to lean toward agreeing that these issues exist. Lastly, while a majority of formal and natural site educators believe the role of the educator helps to introduce the outdoors to students, they were mostly unsure whether the lack of diversity in the outdoors leads to a lack of diversity within STEM and other outdoor professions. Therefore, in summary, more research is needed in varying demographical school settings to determine whether educators and their roles need to be included as part of the issue of critical race theories that limit racial minority participation within the outdoors despite the findings here that show EE is supported by these educators and barriers for these educators are be overcome.

If the Environmental Education Association of South Carolina is currently creating the Environmental Literacy Plan for public schools, the information within this



study must be taken into consideration. Administrators and policy makers can no longer ignore research projects such as this and what the educator statistics are showing. From Comenius, to Rousseau, Pestalozzi, and Froebel, and not ending with Beal and Dewey, but extending well into the 20<sup>th</sup> and now 21<sup>st</sup> century with multiple government agencies focusing, promoting, and encouraging EE; a new EE question arises. The question is not really “why” EE is not mandated around the nation and South Carolina, but “when” will policy makers allow this. While this project is by no means definitive, there are some valid points that one would hope adds to the literature and support for this theory that has a place for all cultures. EE has been demonstrated in multiple ways as being beneficial in all facets of education and while the argument can be made that there is not one best system, could EE be argued as the best system for cultures as it can be modified for any subject? Thus one major recommendation from this project resulted in the need for more research on whether the educator is part of the issue of a lack of participation by marginalized students in the outdoors, and for the purpose of education, all students. Better yet, the best recommendation drawn from this project involves infusing EE and multicultural education.

Extremely important statistics from educators from this district include several aspects: Over 75% of formal educators supported EE regardless of who was implementing it, over 82% agreed that EE should be supported at their schools, and over 89% stated educators’ role helps in introducing the outdoors to students. A large majority of educators (80.3) in this survey expressed that they were aware of multicultural education regardless of whether they had training. If multicultural education has the same goals as environmental education, and EE is supported but not

fully embraced and implemented, then the best suggestion that can be made from this project is for educational policy makers that have embraced multicultural education extensively since the mid 1990s explore the concept of multicultural environmental education. If educators support EE and feel that the role of the educator helps in assuaging the underlying issue explored in this project, then multicultural environmental education theoretically is the avenue being suggested to implement into the learning pedagogies that are currently embraced and encouraged as this theory goes beyond science education and insures the viewpoints of all students can be included.

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## **APPENDIX A**

### **LETTER OF CONSENT**

My name is Todd Beasley. I am a graduate student in the Curriculum and Instruction Doctoral Program at the College of Education, University of South Carolina. I am conducting a survey as part of my dissertation project. If you are an elementary school educator, you are eligible to participate in the survey.

The survey involves answering some general demographic questions and some questions about your knowledge, perceptions and dispositions toward diversity, environmental education, outdoors & participation/usage.

I agree to take part in this project which aims to understand the knowledge and attitudes of educators regarding the perceptions of formal and informal educators regarding diversity, environmental education, and outdoor participation. I understand that agreeing to take part means that I am willing to complete the survey accurately and honestly to the best of my ability. The survey will take about 20 minutes to complete.

I understand that any information I provide is confidential, and that no information that could lead to the identification of any individual will be disclosed in any reports on the project, or to any other party. I also understand that my participation is voluntary, that I can choose not to participate in part or all of the survey, and that I can withdraw at any stage of the survey without being penalized or disadvantaged in any way. I understand that once I complete and submit the survey, I am no longer able to withdraw my participation.

If you agree to complete the survey, please do NOT write your name on it. After you finish filling it out, please put the survey in the envelope and hand it back to the facilitator. By filling out the survey you are consenting to participate.

If you do not want to complete the survey, just return the blank form and envelope to me now.

The results of my project will be available in August, 2014. If you would like a copy of the results of my project or have any questions, please contact me at [beasleyt@heathwood.org](mailto:beasleyt@heathwood.org).

Please keep this letter for your records. Thank you for your participation.

## **APPENDIX B**

### **SURVEY DEFINED TERMS**

**The purpose of this survey is to examine diversity, the outdoors and the role of educators. Please take a moment to complete the following questions. Responses to this survey will be kept confidential.**

**For the purpose of this survey, the following terms are defined:**

1. Diversity – Different ethnic, gender, social, class and racial groups
2. Environmental Education (EE)– Teaching social, economic, cultural, & nature themes using the outdoors
3. Minority – person of color – African American, Hispanic, Latino, Asian, Native American
4. Multicultural Education (ME) – Teaching social, economic, and environmental themes through the lens of many cultural viewpoints
5. Multicultural Environmental Education (MEE) – A blend of environmental education and multicultural education
6. Nature/Natural – Undeveloped, wooded, forested, field, wetland or garden type areas located on school grounds or at state/national parks/forests
7. Outdoors – Natural settings, wildland/woods/forest settings, parks, preserves, no athletic fields/courts, minimal paved trails/boardwalks
8. Outdoor classrooms - on or off-site learning areas with or with/out a shelter centered around a natural setting including gardens. Can include areas with picnic tables
9. Outdoor professions – park ranger, game warden, forester, landscaper/gardener, soil scientist, biologist, geologist, wildlife manager, etc
10. Outdoor use – using of the outdoors with students for classroom activities connected to the curriculum, exploration & discovery.
11. Recreation – settings in the outdoors that do not include athletic fields or courts
12. STEM – Science, Technology, Engineering, Math

## APPENDIX C

### FORMAL EDUCATOR SURVEY

#### **I. Educator Demographic Information – check the appropriate response**

**1. How old are you?**

- ☐ 22-29
- ☐ 30-39
- ☐ 40-49
- ☐ 50-59
- ☐ 60+

**2. How many years have you been teaching?**

- ☐ 0-5
- ☐ 6-10
- ☐ 11-15
- ☐ 16-20
- ☐ 20+

**3. How would you identify your race/ethnic background?**

- ☐ African American
- ☐ Asian
- ☐ Caucasian
- ☐ Hispanic/Latino
- ☐ Native American
- ☐ Other \_\_\_\_\_

**4. What grade/s & subject/s do you teach? \_\_\_\_\_**

**5. Do you feel that there is a lack of diversity within outdoor recreation?**

- ☐ Yes
- ☐ No
- ☐ Unsure

**6. Do you perceive of a lack of diversity within STEM fields and other outdoor natural setting professions?**

- ☐ Yes
- ☐ No
- ☐ Unsure

**7. Which of the following causes may limit minority participation within outdoor settings? Check all that apply.**

- ☐ I do not perceive a lack of minority participation in outdoor settings (above other racial/ethnic groups)
- ☐ Lack of knowledge in what the parks offer
- ☐ Lack of access – no park nearby and no transportation
- ☐ Lack of connections to the historic/cultural role of minorities in these settings
- ☐ Lack of knowledge of park locations
- ☐ Lack of funds to visit (park fees, transportation costs, food costs, equipment)
- ☐ Lack of diversity within the park
- ☐ Visiting the park is outside the culture norm, practices, and values
- ☐ Visiting a managed landscape (paved trails, wide open, picnic shelters) is preferred
- ☐ Park staff is discriminatory
- ☐ Lack of previous knowledge/experience about the natural world
- ☐ Fear of the natural world in these settings
- ☐ Lack of previous opportunity from a role model to take/teach outside
- ☐ Lack of parental involvement
- ☐ Lack of time
- ☐ Unsure
- ☐

Other \_\_\_\_\_

**8. What is the nearest state or federal natural site to your school?**

- ☐ Congaree National Park
- ☐ Harbison State Forest
- ☐ Sesquicentennial State Park
- ☐ Unsure
- ☐ Other -

Name: \_\_\_\_\_

**9. Has an educator from the nearby park site reached out to you to notify you of educational opportunities?**

- ☐ Yes, I was contacted
- ☐ No, I was not contacted, skip to question 13
- ☐ The school was contacted and the information was given to me
- ☐ Unsure

**10. Considering the nearest park, were you contacted by park officials?**

- ☐ No
- ☐ Yes

If yes, what method was used to notify you? \_\_\_\_\_

Approximately, how long has it been since you were contacted by park officials? \_\_\_\_\_



**11. Are you familiar that nearby parks offer educational opportunities and no attached fees for students?**

- ☐ Yes, aware of both
- ☐ Aware of educational opportunities, but not the fee structure
- ☐ Aware of fees, but not the educational opportunities
- ☐ No, not aware of either

**12. How have you used the nearby site in the past for educational purposes? Check all that apply.**

- ☐ Fieldtrip to the site for science related activities using park educators
- ☐ Fieldtrip to the site for science related activities **not** using park educators (e.g., teacher led activities)
- ☐ Fieldtrip to the site for other subjects (not science) using park educators
- ☐ Fieldtrip to the site for other subjects (not science) **not** using park educators
- ☐ Had park educator come visit the school
- ☐ Other:

Describe \_\_\_\_\_

- ☐ Have not used park site for educators as a resource

**13. What are the educational opportunities that you have used at the park site? Check all that apply.**

- ☐ On-site indoor classroom activities/presentations
- ☐ On-site outdoor classroom activities/presentations
- ☐ Guided (with park employee) nature walks
- ☐ Self guided nature walks with educational information
- ☐ Festivals, celebrations, special events
- ☐ Picnic
- ☐ Have not used park site or educators as a resource
- ☐ Other:

Describe \_\_\_\_\_

**14. Are there barriers which keep your school from visiting the nearby park?**

**Check all that apply.**

- ☐ Barriers do not keep me from visiting the park
- ☐ Lack of school funds for transportation, entrance fees, etc
- ☐ Lack of student funds for field trips
- ☐ Lack of time
- ☐ Lack of connections to the curricula
- ☐ Lack of support from other teachers
- ☐ Lack of support from administrators
- ☐ Lack of knowledge related to opportunities at the site
- ☐ Lack of positive student behavior
- ☐ Lack of personal comfort level in leading students in these settings
- ☐ Lack of personal experience in these types of settings
- ☐ Lack of knowledge in answering questions about natural world in these settings
- ☐ Lack of interest
- ☐ Unsure
- ☐ Other: Describe \_\_\_\_\_

**15. What are memorable personal experiences you had as a child in outdoor natural settings? Please be as specific as possible. If “none”, simply answer as “none”.**

**16. What activities do you now participate within outdoor natural settings as an adult? Please be as specific as possible. If “none”, simply answer as “none”.**

**17. Does your school support environmental education (EE) using on-site school outdoor areas and/or off-site natural area learning sites? Check the best answer.**

- ☐ The school supports EE and we have a teacher that does this
- ☐ The school supports EE and we have multiple teachers doing this
- ☐ The school supports EE but nobody is doing it
- ☐ The school does not support EE
- ☐ Unsure

**18. Do you support EE using on-site school outdoor areas or off-site natural area learning sites?**

- ☐ Yes, and I am fine doing it
- ☐ Yes, if somebody else is doing it
- ☐ No
- ☐ Unsure

**19. What barriers constrain educators from allowing EE at schools? Check all that apply.**

- ☐ Lack of funds for creating outdoor classrooms, signage, materials, supplies, etc
- ☐ Lack of available curricular resources
- ☐ Lack of time
- ☐ Lack of knowledge/training in how to use
- ☐ Lack of connections to the curricula
- ☐ Lack of support
- ☐ Lack of knowledge on the benefits
- ☐ Lack of positive student behavior
- ☐ Lack of personal comfort level in leading students in these settings
- ☐ Lack of personal experience in these types of settings
- ☐ Lack of knowledge in answering questions about natural world in these settings
- ☐ Unsure
- ☐ Other: Describe \_\_\_\_\_

**20. Regardless of whether your school allows EE, what personal limitations keep you from using this method? Check all that apply.**

- ☐ No limitations
- ☐ Lack of personal experience in natural settings
- ☐ Lack of knowledge about the natural world
- ☐ Lack of knowledge about what environmental education is about
- ☐ Lack of personal comfort in the natural world
- ☐ Lack of pre-service, in-service, or professional development training
- ☐ Lack of interest in being outside to teach
- ☐ Lack of motivation to take kids outside
- ☐ Lack of time
- ☐ Lack of connection to my own cultural background; cannot make connections for students
- ☐ Unsure
- ☐ Other: Describe \_\_\_\_\_

**21. Do you feel that a lack of minorities in outdoor natural settings is connected to a lack of minorities within STEM fields?**

<b>Strongly Agree</b>	<b>Agree</b>	<b>Unsure</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
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**Please explain:**

**22. Do you feel EE should be supported at your school.**

<b>Strongly Agree</b>	<b>Agree</b>	<b>Unsure</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
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**Please explain:**

**23. To what extent do you agree/disagree that the role of the educator helps in introducing the outdoors to students?**

<b>Strongly Agree</b>	<b>Agree</b>	<b>Unsure</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
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**Please explain:**

**24. To what extent do you agree/disagree educational policy constrains schools with low income, minority populations from allowing EE?**

<b>Strongly Agree</b>	<b>Agree</b>	<b>Unsure</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
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**Please explain:**

**25. To what extent do you agree/disagree there may be inequality between majority Caucasian and low income, minority populated schools from allowing environmental education?**

<b>Strongly Agree</b>	<b>Agree</b>	<b>Unsure</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
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**Please explain:**

**26. To what extent do you agree/disagree that race may play a role in the potential inequality of majority Caucasian and low income, minority populated schools from allowing environmental education?**

<b>Strongly Agree</b>	<b>Agree</b>	<b>Unsure</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
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**Please explain:**

**27. To what extent do you agree/disagree the goals of multicultural education are very similar to that of EE?**

<b>Strongly Agree</b>	<b>Agree</b>	<b>Unsure</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
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**Please explain:**

**28. Are you aware of the concept of multicultural education? Check the best answer.**

- ☐ Yes, I am aware and have training
- ☐ Yes, I am aware but do not have training
- ☐ No, I am not aware
- ☐ Unsure

**29. Are you aware of the concept of multicultural environmental education? Check the best answer.**

- ☐ Yes
- ☐ No
- ☐ Unsure

**30. What are your thoughts on this survey and the issue of under-participation by minorities within STEM fields?**

**31. Would you be willing to take this project a step further and participate in a structured interview or a focus group? Please sign the sign-up sheet with an email address before leaving.**

- ☐ Yes
- ☐ No

## **APPENDIX D**

### **NATURAL SITE EDUCATOR SURVEY**

#### **I. Educator Demographic Information – check the appropriate response**

**1. How old are you?**

- ☐ 22-29
- ☐ 30-39
- ☐ 40-49
- ☐ 50-59
- ☐ 60+

**2. How many years have you been working at a natural site educating students?**

- ☐ 0-5
- ☐ 6-10
- ☐ 11-15
- ☐ 16-20
- ☐ 20+

**3. How would you identify your race/ethnic background?**

- ☐ African American
- ☐ Asian
- ☐ Caucasian
- ☐ Hispanic/Latino
- ☐ Native American
- ☐ Other \_\_\_\_\_

**4. What best categorizes your role at this natural site? Check the best answer.**

- ☐ Educator, including Education Director
- ☐ Ranger, including Head Ranger
- ☐ Forester, including Lead Forester
- ☐ Land Manager
- ☐ Other: Describe \_\_\_\_\_

**5. Do you feel there is a lack of diversity within outdoor recreation?**

- ☐ Yes
- ☐ No
- ☐ Unknown

**6. Do you perceive of a lack of diversity within STEM & other outdoor professions?**

- ☐ Yes
- ☐ No
- ☐ Unknown

**7. Which of the following causes may limit minority participation within outdoor settings? Check all that apply.**

- ☐ I do not perceive a lack of minority participation in outdoor settings (above racial/ethnic groups)
- ☐ Lack of knowledge in what the parks offer
- ☐ Lack of access to transportation
- ☐ Lack of connections to the historic/cultural role of minorities in these settings
- ☐ Lack of knowledge of park locations
- ☐ Lack of funds to visit (park fees, transportation costs, food costs, equipment)
- ☐ Lack of diversity within the park
- ☐ Visiting the park is outside the culture norm, practices, and values
- ☐ Visiting a managed landscape (paved trails, wide open, picnic shelters) is preferred
- ☐ Park staff is discriminatory
- ☐ Lack of previous knowledge/experience about the natural world
- ☐ Fear of the natural world in these types of settings
- ☐ Lack of previous opportunity from a role model to take/teach outside
- ☐ Lack of parental involvement
- ☐ Lack of time
- ☐ Unknown
- ☐ Other – Describe: \_\_\_\_\_

**8. What is the nearest low income & largely minority school to your natural site?**

- ☐ School Name Here \_\_\_\_\_
- ☐ I know where the school is but I can not think of the name
- ☐ Unknown

**9. How have you communicated information to the nearest low income & largely minority school about educational opportunities at your site? Check all that apply.**

- ☐ I have not contacted anybody
- ☐ Phone call
- ☐ Email
- ☐ Mail
- ☐ Personal visit
- ☐ Unknown
- ☐ Other: Describe \_\_\_\_\_

**10. How long has it been since you reached out to the nearest low income & largely minority schools about education opportunities at your site? Estimate your best answer or answer unsure.**

**11. How frequently are attempts made to connect with local schools, including the nearest low income & largely minority schools about educational opportunities at your site? Estimate your best answer or answer unsure.**

**12. How have you observed your site being used for educational purposes by diverse populations excluding majority Caucasian school groups? Check all that apply.**

- ☐ Fieldtrip to the site for science related activities using park educators
- ☐ Fieldtrip to the site for science related activities **not** using park educators
- ☐ Fieldtrip to the site for other subjects (not science) using park educators
- ☐ Fieldtrip to the site for other subjects (not science) **not** using park educators
- ☐ I visited the school as a resource
- ☐ Have not observed park site being used by educators as a resource

**13. What educational opportunities do you observe being used by diverse student populations excluding majority Caucasian school groups? Check all that apply.**

- ☐ Outdoor classroom activities
- ☐ Indoor classroom activities
- ☐ Guided (with park employee) nature walks
- ☐ Self guided nature walks with educational information – no park staff
- ☐ Festivals, celebrations, special events
- ☐ Picnic
- ☐ No school groups of this category have been observed
- ☐ Other: Describe \_\_\_\_\_

**14. Are there barriers which keep low income, largely minority populated schools from visiting natural park sites? Check all that apply.**

- ☐ No unique barriers exist
- ☐ Lack of school funds for transportation, entrance fees, etc
- ☐ Lack of student funds for field trips
- ☐ Lack of time
- ☐ Lack of connections to the curricula
- ☐ Lack of support
- ☐ Lack of knowledge related to opportunities at the site
- ☐ Lack of positive student behavior
- ☐ Lack of personal comfort level in leading students in these settings
- ☐ Lack of personal experience in these types of settings
- ☐ Lack of knowledge in answering questions about natural world in these settings
- ☐ Lack of interest
- ☐ Unsure
- ☐ Other: Describe \_\_\_\_\_



**15. How do you feel schools should support environmental education (EE) using on-site school outdoor areas and/or off-site natural area learning sites? Check all that apply.**

- ☐ Schools should not support EE
- ☐ Schools should support EE and have a teacher that does this
- ☐ Schools should support EE and have a science teacher that does this
- ☐ Schools should support EE and have multiple science teachers doing this
- ☐ Schools should support EE and have multiple teachers doing this through cross curricular
- ☐ Schools should support EE by having informal educators come to the schools
- ☐ Unsure
- ☐ Other: Describe \_\_\_\_\_

**16. What barriers constrain educators from allowing EE at schools? Check all that apply.**

- ☐ No barriers exist
- ☐ Lack of funds
- ☐ Lack of available curricular resources
- ☐ Lack of time
- ☐ Lack of knowledge about the natural world
- ☐ Lack of connections to the curricula
- ☐ Lack of support
- ☐ Lack of knowledge on the benefits
- ☐ Lack of positive student behavior
- ☐ Lack of personal comfort/experience in leading students in these settings
- ☐ Lack of personal experience in these types of settings
- ☐ Unsure
- ☐ Other: Describe \_\_\_\_\_

**17. What are the personal limitations that you feel prevent minority educators from using EE? Check all that apply.**

- ☐ Lack of personal experience in natural settings
- ☐ Lack of knowledge about the natural world
- ☐ Lack of knowledge about what environmental education is about
- ☐ Lack of personal comfort in the natural world
- ☐ Lack of pre-service, in-service, or professional development training
- ☐ Lack of interest in being outside to teach
- ☐ Lack of motivation to take kids outside
- ☐ Lack of connection to cultural background; cannot make connections for students
- ☐ Lack of time
- ☐ Unsure
- ☐ No limitations
- ☐ Other: Describe \_\_\_\_\_

**18. Do you feel a lack of minorities in outdoor natural settings is connected to a lack of minorities within STEM fields?**

<b>Strongly Agree</b>	<b>Agree</b>	<b>Unsure</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
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**Please explain:**

**19. To what extent do you agree/disagree that EE should be supported at low income, large minority student population schools?**

<b>Strongly Agree</b>	<b>Agree</b>	<b>Unsure</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
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**Please explain:**

**20. To what extent do you agree/disagree that the role of school/formal educators helps in introducing the outdoors to students?**

<b>Strongly Agree</b>	<b>Agree</b>	<b>Unsure</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
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**Please explain:**

**21. To what extent do you agree/disagree educational policy constrains low income, minority populated schools from allowing EE?**

<b>Strongly Agree</b>	<b>Agree</b>	<b>Unsure</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
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**Please explain:**

**22. To what extent do you agree/disagree there may be inequality between majority Caucasian and low income, minority populated schools with allowing environmental education?**

<b>Strongly Agree</b>	<b>Agree</b>	<b>Unsure</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
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**Please explain:**

**23. To what extent do you agree/disagree that race may play a role in the potential inequality of majority Caucasian and low income, minority populated schools with allowing environmental education?**

<b>Strongly Agree</b>	<b>Agree</b>	<b>Unsure</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
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**Please explain:**

**24. What are your thoughts on this survey and the issue of under-participation by minorities within STEM fields?**

**25. Would you be willing to take this project a step further and participate in a structured interview or a focus group in order to provide richer responses and items not considered?**

☐ Yes

☐ No

## **APPENDIX E**

### **FORMAL EDUCATOR RESPONSES TO OPEN-ENDED QUESTIONS**

Only 12 (16%) formal educators responded with written feedback. No patterns were identified; however, there may have been a weak connection in educators referring to the need for a role model or educator providing the opportunity and needing access from the following statements:

1. Children cannot aspire to what they don't know
2. If prior knowledge is not built there will be a decrease in wanting to make a career out of it
3. No role models to take after
4. Not as many opportunities perhaps or knowledgeable people to teach them of the benefits of the outdoors
5. What you are not exposed to will keep you from knowing jobs you can dream of

#### **Question 22. Do you feel EE should be supported at your school.**

18 or 24% provided written explanation to this question. One definitive pattern was identified: the benefits that EE provides.

#### **Question 23. To what extent do you agree/disagree that the role of the educator helps in introducing the outdoors to students?**

23 or 31% provided an explanation. The basic theme that was deciphered is that the role of an educator in introducing not only things like the outdoors and EE to students, but all new experiences as it is part of an educators job to be role models and

teach children things they are not getting at home.

**Question 24. To what extent do you agree/disagree educational policy constrains schools with low income, minority populations from allowing EE?**

15 or 20% of educators wrote a further explanation. Funding was one topic in a sense that funding goes to other priorities first; however, funding was also mentioned in reference to grants being available, no money is needed for free observations outside. Time was another them mentioned a couple of times in that “time” to implement and time taken away due to teaching for test scores.

**Question 25. To what extent do you agree/disagree there may be inequality between majority Caucasian and low income, minority populated schools from allowing environmental education?**

14 or 18.7% replied with a further written response. Money was the most obvious theme being mentioned in that Caucasian schools have more money and the parents of these schools have more money allowing flexibility with parents to be available to assist outdoors.

**Question 26. To what extent do you agree/disagree that race may play a role in the potential inequality of majority Caucasian and low income, minority populated schools from allowing environmental education?**

7 educators, or .09% followed through with providing written feedback. No themes were identified.

**Question 27. To what extent do you agree/disagree the goals of multicultural education are very similar to that of EE?**

5 educators representing .07% of the sample population conveyed information. Again, no patterns were identified.

## APPENDIX F

### NATURAL SITE EDUCATOR RESPONSES TO OPEN-ENDED QUESTIONS

Due to the limited number of responses from participants from each natural site, responses to questions have been grouped together in order to protect confidentiality. One question, number 7, did not have a space for additional information; however, two respondents provided a side note to **“Which of the following causes may limit minority participation within outdoor settings? Check all that apply”**:

1. Other – Describe: Lots to say. I don’t know if there is a lack or not. I think it’s a matter of participation mixed with misunderstanding. My personal experience’s living, working, visiting, recruiting in areas that are deemed minority majority etc, is not that they don’t recreate... it’s just that they don’t recreate in ways that involve the use of a visitor center. The African American population surrounding the park is constantly recreating within our borders (fishing, birding, etc). They just don’t use the visitor center. Something they never have done or grown accustomed too. They, like every individual, community, social scenes use recreational sites differently. The way surveys are done may not be the best appropriate tool to capture a more truer essence of how the minority groups recreate. Maybe we should ask “how” instead of “if”. Perceptions.
2. Other – Describe: Lack of training for park staff to help them connect with ad diverse audience.

**Question 18. Do you feel a lack of minorities in outdoor natural settings is connected to a lack of minorities within STEM fields?**

**9 of 15 (60%) respondents provided additional written information.**

1. Maybe connected in the sense that the same reasons cause both, but do not believe it is a causal relationship.
2. Never thought enough about the relationship.
3. I believe it is due to the lack of knowledge and the comfort level of these individuals in outdoor natural settings.
4. If students aren't encouraged to learn outside and have their curiosity flourish – they may be discouraged from joining fields associated with science.
5. I am making an assumption, but perhaps the lack of examples of adults in careers in STEM impacts young peoples interest in the natural world... or STEM field seem like they are for "other people".
6. Many students are surprised by the wonders found in natural settings. Increasing exposure to natural world would likely increase minority interest in STEM.
7. That's a huge jump from outdoor settings to professional STEM fields. Hard to draw conclusions with that far of a leap and given information.
8. I agree to a certain extent. I feel that part of it relates to the students also not having encouragement to the outside at home, and the propensity of growing up in an urban, city setting.
9. I'm not sure about the number of minorities in STEM fields.

**Question 19. To what extent do you agree/disagree that EE should be supported at low income, large minority student population schools?**

**12 of 15 (80%) respondents provided additional written information.**

1. EE has been proven numerous times to benefit students academically and behaviorally, thus all students should have EE in their schools.
2. EE should be taught in all schools equally, we all live in the environment.
3. All children should be educated about their natural surroundings and the role that it plays in their everyday lives.
4. But I believe it should be supported for all schools, not just low income, minority schools.
5. EE is a growing field that enriches the lives of children. Race nor ethnicity should stand in the way.
6. It is vital to the preservation/conservation of our parks and natural resources.
7. We all need to have opportunities for EE because we have a role in protecting our environment.
8. All students need to know about their surrounding environment and how it works, what mankind's impacts are, and how best to live in a way that best protects and utilizes their surroundings, maintaining ecological balance.
9. All students should be supported in EE!!
10. Many students that have trouble indoors thrive in an outdoor setting. Low income students can often engage in outdoor STEM activities that would not be of interest indoors.
11. All students, regardless of income level, should have an opportunity to experience EE activities – I believe it is especially important that minority students are exposed to



potential careers in the sciences and federal land management agencies to encourage those students to pursue those areas of study.

12. Outdoor learning and EE should be heavily used in all classrooms – no matter what the student make up is or how much money the family has.

**Question 20. To what extent do you agree/disagree that the role of school/formal educators helps in introducing the outdoors to students?**

**12 of 15 (80%) respondents provided additional written information.**

1. I feel that most schools are not introducing students to the outdoors.
2. It has the best chance to be “introduced” at home – at school it is a novelty/school thing.
3. Schools are not concerned with taking kids outside - they focus more on academics. I do think they could.
4. Any educator can teach in an outdoor environment, introducing nature to the children. Many teachers simply do not want to take the time to make the arrangements.
5. I think parents play a much greater role than educators.
6. I think most schools are not comfortable about letting the students roam the “woods”.
7. Learning in the classroom is not the same as learning in the natural surroundings.
8. The role of school/formal educators is to introduce things that they may not otherwise be introduced to at home. This role is vital.
9. I believe teachers have the ability to greatly impact students whose parents/family may not expose them to the outdoors.
10. Formal educators are great/sure (indecipherable wording) helpers. They may be the only connection minority students have to outdoor environments.
11. Teachers play a big role in helping students learn about their surroundings and

facilitate further learning through projects and field trips (when funding allows).

12. I do not know a large number of teachers who take students outside and introduce them to natural world. Most teachers who bring students here are not comfortable in outdoors.

**Question 21. To what extent do you agree/disagree educational policy constrains low income, minority populated schools from allowing EE?**

**11 of 15 (73%) respondents provided additional written information.**

1. There may be a perceived constraint as there is pressure to “teach to the test” (PASS, etc), but truth is EE can aid students in better achievement and these tests.
2. The current state standards limit the time teachers can use to teach EE.
3. It is constrained by funding, by standards, and by safety regulations.
4. Nature does not cost anything. Simply teaching in an outdoor environment introduces kids to the outdoors, no matter the subject.
5. Not familiar enough with ed. policy.
6. Not sure of policy constraints; however, I can see how funding could be an issue.
7. I’m not familiar with all constraints, but know testing probably takes time that could be used for EE.
8. I feel that there is a constraint placed on EE in low income minority heavy schools, but I can’t speak to the extent. Because these schools also have students who are not performing well on standardized testing, that becomes the priority.
9. Safety issues and some curriculum often limit minority access to EE.
10. I don’t have enough background knowledge on the subject.
11. Many low income schools may feel that they don’t have adequate resources to do EE.

**Question 22. To what extent do you agree/disagree there may be inequality between majority Caucasian and low income, minority populated schools with allowing environmental education?**

**9 of 15 (60%) respondents provided additional written information.**

1. I feel so few schools teach EE that only a small gap exists. Everybody is not exposed enough.
2. Behavioral, academic, and teacher comfort level concerns limit EE's chances at low income schools.
3. I believe the major barrier lies in funding to promote outdoor education and to transport children to natural areas.
4. The resources for trips and additional educators is available.
5. Again, going outdoors is free. Low income schools may not have the same resources, but all subjects can be taught in an outdoor environment.
6. Majority Caucasian schools are going to get more funding because of the possibility of higher test scores, allowing more field trips and better classes such as environmental sciences and classes connecting students outdoors. Lower income schools, again, get lower funding and are more focused on passing standardized tests.
7. Caucasian students are more likely to attend schools that offer EE. Many urban schools with high minority numbers are surrounded by degraded resources and unsafe outdoor environments.
8. See my response for #21 ( I don't have enough background knowledge on the subject)  
I am making as assumption based on observation/experience that the lack of funding for field trips impacts the opportunity to experience EE at low income schools.
9. There's inequality in almost all other realms; why would schools be excluded?

**Question 23. To what extent do you agree/disagree that race may play a role in the potential inequality of majority Caucasian and low income, minority populated schools with allowing environmental education?**

**9 of 15 (60%) respondents provided additional written information.**

1. Race in itself is not limiting, but maybe cultural norms of race and/or concerns in low income schools limits it.
2. Many minorities don't seem interested in the outdoor world. There is also a social economic effect.
3. Race shouldn't play a factor, but often does. Minority adults seem to not have the outdoor experience or knowledge or interest in EE.
4. Race has always played a role, although it may seem different. Racism has become more subtle, but still apparent.
5. I believe the race of the educator plays a vital role in the instructors' willingness to teach EE.
6. See response to #21 (I don't have enough background knowledge on the subject).
7. Difficult to separate race and funding.
8. Not good for comparison. Very large all encompassing group – "majority Caucasian". Very specific, isolated group – "low income, minority".
9. Not sure, but because minorities tend to have less enthusiasm for the outdoors and outdoor rec, there is less focus on getting the students out there.

**Question 24. What are your thoughts on this survey and the issue of under-participation by minorities within STEM fields?**

**13 of 15 (87%) respondents provided additional written information.**

1. Minorities and non-minorities should have more EE, but I'm not sure that the lack of EE adds to the lack of minorities in STEM fields.
2. Exposure is important to begin to undo the lack of comfort in the outdoors and thereby

begin to interest minorities in STEM outdoor fields.

3. Very interesting survey. the issue can only be resolved by reaching out to minority groups and finding ways to educate, and get them interested in learning about their natural surroundings.

4. I believe the problem lies in education politics. They don't make decisions to benefit students.

5. I believe that minorities are simply not as interested in these fields. Probably due to their previous generation not instilling the importance of them. The way the world is changing, STEM fields are most important.

6. At our site, we have a lot of minorities, but we also have more affluent, Caucasian schools, so I'd say it's almost 50/50? Many low income minority schools visit our site because the cost is low, and not for any other reason.

7. I think they are really missing a great opportunity.

8. We need to provide more opportunities for minorities to participate in EE.

9. There is a definite need to understand minority participation in EE and I hope this survey will help facilitate discussion and bring light to the issue and bring about possible solutions.

10. The questions could be re-worded. Gross comparisons, (with an arrow showing a side note referencing gross - as in comparing this are too unlike -somewhat indecipherable writing), are hard to answer. It's hard to compare a broad statement or classification against something that is so specific.

11. Difficult to separate confounding variable. Difficult to think of race ramifications in this cause and effect survey as a stand alone factor.

12. We don't see enough diversity in our park visitation (general public and education groups). Recent U of Idaho surveys of non-visiting African Americans in Columbia proved this point... and many participants cited a fear of wild places like Congaree. We need to make natural places more relevant and accessible to all!

13. I'm interested to see the results of this survey: and more importantly, how we can address this inequality. It is particularly heart breaking to see STEM fields dominated by white men. Women are also horribly under-represented in these fields.

## **APPENDIX G**

### **FOCUS GROUP DISCUSSION NOTES**

One common question to all three groups of participants from each natural site: What are your additional thoughts on this survey topic. Due to the extremely small amount of individuals in each group, for confidentiality, and to provide extra comfort as the researcher knew most of the participants, recording was not practiced. Each focus group lasted approximately 20-25 minutes. Only two people from each site participated in the focus groups. The researcher compiled notes, transcribed them onto a WORD document and then emailed them back to a point of contact at each site for accuracy.

#### **Harbison State Forest Notes:**

Harbison State Forest staff provided the least amount of additional comments as there was a meeting within the building that required their attention. The topic has come up, they were aware of the issue, but due to minimal staffing and budget constraints were unable to address the issue. The current coordinator would like the issue to be explored in the future.

#### **Sesquicentennial State Park Notes:**

\*Staff has noticed trends; however their park has high minority African American and Hispanic population visitation trends in the summer. Picnic areas are also frequented by these same groups. African Americans stay in managed areas; Caucasians venture beyond – Caucasian representation decreases in summer, African American increases

\*There is a lack of representation by diverse groups in the “wilderness” of Sesqui

\*Staff has begun addressing the issue with the construction of a 2 mile “paved” trail as the preferences for diverse groups are different than Caucasians

\*State “Forest”, National “Forest” indicate more wild settings. National Park evokes “adventure”. Park definition varies among groups but has a commonality that there is probably some managed landscape areas

\*Brand label of National Park attracts more diverse groups from a larger area

\*State park is more local – more diverse groups especially during vacation seasons when those with the means, typically Caucasian, can go out of town. Entrance fees for park are reasonable prices for diverse populations compared to going to the coast or mountains.

\*Staff has noticed educators bringing diverse groups - but using the park for means beyond EE – examples of structured free play like kite flying, and picnics. Staff reminds educators of EE visitors – observations have determined that educators do not know themselves basic nature concepts including flora and fauna – comfort level is low – among many teachers, not just minority educators

\*Attempts have been made for partnerships with low income minority schools; however this is contingent upon the school initiator and support level from school administrators

\*Teachers desire to take field trips that are longer than a few minutes away from their schools

\*Title I Schools receive more funding – so they go above and beyond on field trips – even out of state

\*Nearest low income largely minority school has never visited

\*Park working on connecting African American contributions in the park system – highlighting CCC workers from the 1930s



**Congaree National Park Notes:**

\*Local African American residents surrounding Congaree may be fearful of the “swamp” because of past negative connections with the outdoors and this trickles down through generations.

\*Current funding worries affect initiatives

\*National Park Service has a Call to Action initiative for Centennial 2016 focusing on diversity and accountability

\*The concept of outdoor etiquette is different for cultures and how you connect is different – new generation focuses on technology and if technology is “lost” due to no wi-fi in the setting then this is a turn off to many

\*NPS Academy – African American exposure to outdoors – initiative to increase diversity in staff by recruiting youth to introduce and increase interest to outdoors

\*Nationwide NPS has diversity – staff movement – staff come from all walks and places so they are aware of diversity

\*More competition with other folks and entities that focus on EE, like zoos and gardens and have more staff solely devoted to this area